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PROJECT W-314 DST & DCRT INSTRUMENT & CONTROL
SYSTEMS INITIAL ASSESSMENT [SEC 1 OF 3]

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(REV 0)

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Page 1 of 1

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PROJECT W-314 DST AND DCRT INSTRUMENT AND CONTROL SYSTEMS, INITIAL ASSESSMENT

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Westinghouse Hanford, Richland, WA 99352

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Abstract: This report contains an assessment of the Instrument and Control Systems in the Double Shell Tank Farms and the 244-A DCRT. The assessment report contains data from physical inspection activities and an overall Engineering Assessment of the Instruments and Control Systems in use in the Double Shell Tanks.

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Kara Broz *1/18/96*
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**TANK FARM RESTORATION
AND SAFE OPERATIONS (TFRSO)**

**PROJECT W-314
DST AND DCRT
INSTRUMENT AND CONTROL SYSTEMS
INITIAL ASSESSMENT REPORT**

**REVISION 0
December 18, 1995**

Prepared for:

U.S. Department of Energy
Richland Operations Office
Richland, Washington 99352

Prepared by:

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FOREWORD

The draft of this document was reviewed by the Engineering Staff at the ARES Corporation. Their comments are contained in the document "Review of Initial Assessments of Double-Shell Tanks in support of Project W-314", December 1995, Report No. 951119-001. Comments were incorporated into the draft in the PDRD Cross Reference Table, to clarify which PDRD functions have associated existing architecture in the Tank Farm and in other tables. Additional studies were recommended by ARES where Architecture had been determined not to exist by the PDRD Cross Reference Tables. Many of these new studies have been added to the list of studies that are already recommended.

It is noted that the "Initial Assessment" studies were produced to evaluate the Tank Farm equipment and did not have, as a purpose, the delineation of specific scope for the W-314 Project. Plant equipment condition assessment and suitability for mission was the primary function of the "Initial Assessment". Decision making documentation as to the specific scope of Project W-314 occurs in other documentation produced by the Program Office. This document is only one of several documents that have input to the decision making process.

In general, the ARES review was helpful and specific problem areas that were pointed out were readdressed by the Author.

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**INITIAL ASSESSMENT REPORT
INSTRUMENTS AND CONTROL SYSTEMS**

EXECUTIVE SUMMARY

An assessment of the Instrument and Control (I & C) Systems in the Double Shell Tank Farms and the 244-A DCRT was carried out. The assessment involved both physical inspection as well as engineering analysis. The Project W-314 Preliminary Design Requirements Document (PDRD) established the required functionality for the existing I & C systems.

Most of the I & C systems can not be expected to last for the duration of the mission, which is specified at 30 years. Some of the I & C systems are in violation of administrative codes or technical codes. Much of the equipment is obsolete. Almost all of the equipment has been installed with buried wiring interconnecting both power and signal. This wiring can not be expected to last the duration of the mission and some wiring has failed already.

Several of the instrument systems are continuous users of instrument air. Some are heavy users of air. The compressor systems and associated piping in some farms are maintenance intensive and some piping in some farms is corroded and leaking.

Almost all electrical and pneumatic I & C systems are recommended for upgrade. Several studies are recommended to determine the best approach for an upgrade. Some systems are recommended for elimination.

1.0 INTRODUCTION

The primary objectives of the Tank Farm Hardware Initial Assessment were to determine if the functionality of existing systems is sufficient to fulfill the mission needs defined in the Preliminary Design Requirements Document (PDRD) and to determine if the life expectancy of the existing systems would be sufficient for the mission duration. The PDRD defines the system functionality required to meet the mission for 30 years duration. This is the primary resource document for this assessment. Additional references to other requirements are made in the Functions Assessment Table, but these are few.

The initial assessment reported here is not comprehensive. Severe schedule restrictions as well as practical tank farm equipment access limitations have limited the assessment activities. There are significant omissions and it is anticipated that further efforts later this year will yield additional findings.

Some systems that have been assessed as requiring upgrades may, in fact, not require significant change, if waivers from "legal" requirements or memorandum of understanding can be obtained from the regulating agency which allows interpretation of the legal requirement in such a way as to eliminate the need for changing the system. The PDRD does not address these mitigating circumstances.

ASSESSMENT PROCEDURE

The following questions were asked in order to carry out the assessment:

- o What existing hardware (architecture) is currently satisfying the PDRD required functions?
- o Does the existing hardware (architecture) comply with specified functionality and/or constraints?
- o How well does the existing hardware (architecture) meet the performance requirements specified in the PDRD?
- o Can the existing hardware (architecture) be extended to meet the Mission requirement of additional + 30 years.

Many activities were carried out to answer these questions for the various Instrument and Control Systems. A considerable of data documentation was reviewed and data from the various activities was amassed in various tables. The activities that were carried out and the data tables that were produced are explained in the following documentation. Figure 1. illustrates an overall view at the data flow path among these documents. The dashed line blocks indicate documents which are not a part of the assessment effort.

TANK FARM EQUIPMENT ASSESSMENT PROCESS
(DATA FLOW)

Figure 1.

EXISTING ARCHITECTURE DETERMINATION

In order to determine the existing (hardware) architecture that matches PDRD functionality, an Analyst reviewed the PDRD and created a Systems Architecture Tree. This System Architecture Tree represents a simplified model of the existing hardware. This model is verified two ways. A PDRD Cross Reference Table lists all of the system functions specified in the PDRD and relates these to the System Architecture Tree block diagrams. The model is further verified by a System Drawing Reference Table which lists the major drawings associated with the existing equipment (architecture). Further details of these tables are listed in the "DATA ARRANGEMENT" section.

SYSTEM COMPLIANCE WITH FUNCTIONALITY AND/OR CONSTRAINTS

The system function compliance analysis was carried out on several levels. The Functions Assessment Table contains a summary of the methods of analysis, and a brief findings statement associated with each major System, Structure or Component (SSC). There are three major methods of analysis. These are the **Engineering Analysis**, the **Inspection Activities**, and the **Testing Activities**.

An **Engineering Analysis** was carried out to review the Engineering Design Media to determine if the system was correctly designed to meet the PDRD required functionality. Additional Supporting Documentation was referenced if it had a bearing on the determination.

Further details of these tables are listed in the "DATA ARRANGEMENT" section.

SYSTEM PERFORMANCE ASSESSMENT

The Engineering Analysis and other Supporting Documentation may also include narrative indicating system performance capability or limitations. Estimates of life expectancy may be found here or in other activities.

Inspection Activities were carried out by qualified Inspectors on selected equipment. Individual equipment items were examined, if they were accessible in a timely manner at reasonable cost and considering ALARA. Equipment was evaluated against its ability to perform its intended purpose. Equipment that was replicated many times, ie. electrical terminal boxes, were sampled on an opportunistic basis. Inspectors estimated equipment life extension capability based upon their experience with maintaining similar equipment.

The **Condition Assessment Survey (CAS)** methodology was utilized to guide the inspection of much of the selected equipment and its output was incorporated in the tabulation of data. This output, for the I&C Systems, is available in the Condition Assessment Information System (CAIS) data sheets. In addition, the Inspector has included a summary narrative for each Tank Farm which identifies key findings.

It should be noted that I&C Systems are associated with the other Initial Assessments for the other Systems. Considerable information on I&C systems is located in the Electrical Inspections and to a lesser extent in the other inspection areas. The findings in the Electrical Inspections were extensive and these have been reproduced in **Appendix 1**, in section fifteen. **Appendix 2**, contains the inspector's surveys of three tank farm instrument air compressor systems.

Additional Field Assessment Questionnaire Tables were prepared by the Analyst for use by the Inspector to conduct surveys of Maintenance and Operations staff about the performance and maintainability of specific types of hardware.

In some situations, **Special Testing Activities** were carried out to augment the CAS inspections. This testing was guided by Engineering and documents were generated which reported the results. References to these documents are found in this section, when it is applicable.

Further details of these tables are listed in the "DATA ARRANGEMENT" section.

SYSTEM CONDITION RATING

The Capital Asset Management Process (CAMP) Rating Program developed for the Department of Energy was utilized to provide a rating of the system deficiency. This program is a set of spreadsheet macros written for the Microsoft EXCEL Program by the Systematic Management Services, Inc. These CAMP Worksheets are contained in the CAMP Worksheets subsections. Further brief support statement for the ratings are found in the Functions Assessment Tables.

FINDINGS SUMMARY

There are dozens of Instrument and Control Systems in use in the Tank Farm Complex. The Initial Assessment focused on the six Double Shell Tank Farms and the 244-A Double Contained Receiver Tank. The amount of data amassed during this effort was very large. The balance of this document contains this data with the consequence that it is very large and it is difficult to extract the significant problem areas.

The following three tables summarize the findings by Facility and by System. These findings are predicated on the functions declared as required in the PDRD. In many cases, the PDRD did not contain sufficient "Technical Specification" to completely evaluate the capabilities of existing hardware (architecture).

The letter "Y" in a table cell indicates that the item is a candidate for upgrade. The adjacent number in a table cell is the "CAMP Project Rating" for that subsystem. It provides a measure of the system deficiency. It also indicates, to some extent, that there

is significant evidence to be found in the balance of the document to indicate a serious need to upgrade the corresponding system at the designated facility.

Superscripts on these letters refer to a particular type of instrument subsystem.

Subscripts on these letters **refer to notes** which are added at the bottom of the tables to qualify these assertions. In many cases, it was felt that additional studies were required to complete the assessment. These studies are identified in notes listed at the end of the table.

The number contained in **parenthesis** () in each column heading identifies associated architecture.

The number contained in **braces** {} in each column heading identifies associated PDRD numbers.

A [N-A] means the item was not assessed. Blank cells indicate that there is nothing applicable for that facility.

TABLE 1.

EXISTING ARCHITECTURE PROJECT W-314 I & C UPGRADE CANDIDATE TABLE											
I&C System Location ----->	Tank Annulus			Leak Detection Pit/Sump			Tank	Transfer Pits (Clean Out Boxes need leak detect. only)		Master Pump Shutdown	
	Leak Detection System 'Manual Tape ² SpG-WF ³ Multi- Level (I1.2.2)	CAM Radiation Monitoring System (I1.2.1)	Pump Pit Leak Det. System (I1.2.3)	Level Sensing System (SpG-WF System) (Sump)	Gamma Radiation Monitoring System (Sump)	Leak Detection System (Pit) (I1.1.3)	High Waste Level Detection System (I1.7)	Pit Leak Detection Systems (Floor) (I1.3.1) (I1.3.3)	Pipe Annular Leak Detection Systems 'Continuity Sensor ² Pressure Sensor (I1.3.3)		Farm Relay Control Panel (I1.4.1)
TANK FARMS & OTHER + V											
AW	¹ Y ₅ / 52	Y _{1,11} / 43	Y / 60	Y ₅ / 50	Y / 56	Y / 60	Y / 57	Y / 60	Y / 60	Y / 55	
SY	¹ Y ₆ / 52	Y _{1,11} / 43	Y / 60	Y ₅ / 50	Y / 56	Y / 60	Y / 57	Y / 60	Y / 60	Y / 55	
AY	³ Y / 52	Y _{1,11} / 43	Y / 60	Y ₅ / 50	Y / 56	Y / 60	Y / 57	Y / 60	Y / 60	Y / 55	
AZ	³ Y / 52	Y _{1,11} / 43	Y / 60	Y ₅ / 50	Y / 56	Y / 60	Y / 57	Y / 60	Y / 60	Y / 55	
AN	¹ Y ₆ / 52	Y _{1,11} / 43	Y / 60	Y ₅ / 50	Y / 56	Y / 60	Y / 57	Y / 60	Y / 60	Y / 55	
AP	¹ Y ₆ / 52	Y _{1,11} / 43	Y / 60	Y ₅ / 43	Y / 56	Y / 60	Y / 57	Y / 60	Y / 60	Y / 55	
244A DCRT	² Y ₆ / 52	Y ₁ / 62	Y / 60					Y / 60	Y / 60		
Not Assessed - but is expected to be similar to 244-A DCRT.											
244S DCRT											
242-A											Y / 55
242-S											Y / 55

EXISTING ARCHITECTURE PROJECT W-314 I & C UPGRADE CANDIDATE TABLE

Subscript indicates a qualifying comment.

I&C System Location ----->	Service Pit/ Flush Pit		Tank Farm Piping		Tank Waste			HVAC			
TANK FARMS & OTHER - V	Flow Monitoring System (S.P. & F.P.) (13.5.1.1)	Radiation Monitoring System (S.P.) (13.5.1.2)	Primary Pipeline Pressure Monitoring (Leakage or Misrouting) (11.3.2)	Pipeline Heat Trace System limited assessment (17)	Cathodic Protection System Monitoring limited assessment (18)	Specific Gravity Instr. System (14.3.1)	Temperature Probes ¹ T/C Tree ² T/C single (14.1)	Liquid Level ¹ FIC Gauges ² Press. Gauges (14.4)	Tank Primary Differential Pressure Monitoring System (12.1.1)	Main Stack Monitoring System (12.1.8)	Tank Annulus Differential Pressure Monitoring System (12.2.1)
AW	Y / 45	[N-A]	Y ₁₂ / 56	Y ₈ / 50	Y ₁₃ / 43	Y _{6.5} / 42	¹ Y ₉ / 43	¹ Y / 61	Y / 50	Y / 60	Y ₁₃
SY	Y / 45	[N-A]	Y ₁₂ / 56	Y ₈ / 50	Y ₁₃ / 43	Y _{6.5} / 42	¹ Y ₉ / 43	¹ Y / 61	Y / 50	Y / 60	Y ₁₃
AY	Y / 45	[N-A]	Y ₁₂ / 56	Y ₈ / 50	Y ₁₃ / 43	Y _{6.5} / 42	¹ Y ₉ / 43	¹ Y / 61	Y / 50	-	Y ₁₃
AZ	Y / 45	[N-A]	Y ₁₂ / 56		Y ₁₃ / 43	Y _{6.5} / 42	¹ Y ₉ / 43	¹ Y / 61	Y / 50	-	Y ₁₃
AN	Y / 45	[N-A]	Y ₁₂ / 56	Y ₈ / 50	Y ₁₃ / 43	Y _{6.5} / 42	¹ Y ₆ / 43	¹ Y / 61	Y / 50	Y / 60	Y ₁₃
AP	Y / 45	[N-A]	Y ₁₂ / 56	Y ₈ / 50		Y _{6.5} / 42	¹ Y ₉ / 43	¹ Y / 61	Y ₁₁	Y / 60	Y ₁₃
244A DCRT	Y	Y / 55		Y ₈ / 50	Y ₁₃ / 43	Y _{7.5} / 42	² Y / 43	² Y / 42	Y / 50		Y ₁₃
244S DCRT											
Not Assessed - but is expected to be similar to 244-A DCRT.											

Not Assessed - but is expected to be similar to 244-A DCRT.

EXISTING ARCHITECTURE PROJECT W-314 I & C UPGRADE CANDIDATE TABLE								Subscript indicates a qualifying comment.
I&C System Location ----->	STATUS DISPLAY					REMOTE ALARM MONITORING		
	Tank Farm Status Monit. (old PANALARM)	Remote Alarm Monitoring		Tank Structure	Inst. Bldgs.			
		Safety & Essential Equipment Status Monitoring {3.2.1.1.2.1 -> 3.2.1.1.2.5} (16.)	Game-Well Remote Alarm Monitoring (11.6)			CASS Remote Alarm Modules (16.)		Thermocouple Data Acquisition (16.4)
TANK FARMS & OTHER I V								
AW	Y	Y / 50	[N-A]	[N-A]				
SY	Y	Y / 50	[N-A]	[N-A]				
AY	Y	Y / 50	[N-A]	[N-A]				
AZ	Y	Y / 50	[N-A]	[N-A]				
AN	Y	Y / 50	[N-A]	[N-A]				
AP	Y	Y / 50	[N-A]	[N-A]				
A Farm					Y			
BY Farm					Y			
C Farm CR-271					Y			
SX Farm					Y			
U Farm					Y			
242-T					Y			
244-AR 204-AR Vent Station					Y			

NON-EXISTING ARCHITECTURE

PROJECT W-314

I & C UPGRADE CANDIDATE TABLE

Subscript indicates a qualifying comment.

[illegible]

Notes or recommended Trade Studies

- 1 A **Trade Study** should be made to determine the sensitivity of the old Annulus Leak Detection CAMs. The Study should determine required sensitivity and the suitability of this type of instrument for the required leak detection function.

The Annulus CAM Recorders need to be functionally replaced. A data tie-in to TMACS should be implemented.
- 2 Very few pipeline pressure switches exist. A **Trade Study** should be made to specify which pipelines require this type of monitoring.
- 3 Very little electronic valve position sensing exists. There are some limits switches on flush water valves. A **Trade Study** should be made to specify which valves require electronic monitoring.
- 4 Very little pipeline flow monitoring exists and none exists on waste transfer pipelines. A **Trade Study** should be made to specify which pipelines require flow monitoring.
- 5 Replacement of the Annulus Flake Box Leak Sensors and the Leak Detection Pit SpG-WF Sensors will minimize (help eliminate) the need for instrument air. A **Trade Study** should be made to determine the cost effectiveness of eliminating instrument air in the Tank Farms.
- 6 Tank Waste Monitoring Specific Gravity - Weight Factor Instrument Systems do not exist in all (only 5) tanks. A **Trade Study** should be made to determine the need for automation of this function.
- 7 The DCRT SpG\WF Systems also provide waste liquid level and tank pressure measurements, a confusing mixed function. A **Trade Study** should determine the most effective way to measure hydrostatic head and other associated measurements.
- 8 The Pipeline Heat Trace System is not generally functional. However, it **doesn't** seem to be required. A **Trade Study** should be carried out to determine which pipelines require heat trace & what is the best pipe heating method.
- 9 Only the old style T/C Trees need to be replaced and only if a newer tree isn't already installed. Data acquisition should take advantage of existing or extended TMACS architecture.

- 10 Selected HVAC Instrumentation (data) requires connection to automatic data acquisition. A **Trade Study** should be carried out to determine what will be the most effective. Reference the W-314G Conceptual Design (WHC-SD-W314-ER-002, Rev 0).
- 11 Only a partial upgrade is indicated for the Annulus CAM instruments. A **Trade Study** (work with Item 1.) should be made to determine the most effective way to add automatic data acquisition for this function.
- 12 A **Trade Study** should be carried out to determine the type of pipeline primary containment pressure monitoring system that should be installed, if any.
- 13 A **Trade Study** should be carried out to determine the extent of automated monitoring required for the Pipeline Cathodic Protection System.
- 14 A **Trade Study** should determine which double shelled pipelines require instrumentation to allow detection of failures in the secondary containment piping.
15. A **Trade Study** should be carried out to determine what instrumentation will be required in the Leak Detection Pits in order to run the pit/sump dry. It should be determined if density measurement are required for the leak detection function.
16. Architecture does not exist for many of the control functions specified in the PDRD. Many of these functions are obtained by administrative or manual means. A **Trade Study** should be carried out to determine the need for Automatic Controls and the approach for implementation for the following functions:
 - 3.2.1.1.1.8 Initiate Action to Correct Intrusion.
 - 3.2.1.1.1.12 Initiate Action to Correct Abnormal Waste Temperature Conditions.
 - 3.2.1.1.1.16 Initiate Action to correct Waste Level Abnormal Conditions.
 - 3.2.1.1.1.20 Initiate Action to Correct Leaks.
 - 3.2.1.1.1.28 Initiate Corrective Action for Abnormal Vapor space Temperature.
 - 3.2.1.1.1.32 Initiate Tank Structure Temperature Corrective Action.

- 3.2.1.1.1.36 Initiate Action to Correct Abnormal Vapor Space Pressure.
- 3.2.1.1.1.40 Initiate Action to Correct Abnormal Flammable Gas Concentration Conditions.
- 3.2.1.1.2.2 Assess Operability of Essential Transfer Tank System and Equipment.
- 3.2.1.1.2.3 Assess Operability of Essential Interconnecting Systems and Equipment.
- 3.2.1.1.2.15 Verify Safe Shutdown.
- 3.2.1.1.2.16 Secure Failed Equipment.

17.

Architecture does not exist for some monitoring functions specified in the PDRD. These functions are either obtained by administrative or manual means or they are not carried out at all. A **Trade Study** should be carried out to determine the need for Monitoring Instrumentation System and/or Automatic Controls and the approach (recommended measurement technology) and measurement frequency for implementation for the following functions:

- 3.2.1.1.2.11 Monitor Waste Flow Rate.
- 3.2.1.1.2.12 Verify Transfer Volume.
- 3.3.1.2.3 Solids Monitoring.
- 3.2.1.1.1.42 Monitor Treated Effluent (moisture, which volatile organic compounds require monitoring, which hazardous/toxic chemicals require monitoring, etc)

2.0 DATA ARRANGEMENT

SECTION DESCRIPTIONS

This document deals with the assessment of Instrumentation, Control Systems and Data Acquisition Systems used in the Tank Farms. Three other documents deal with Electrical systems, HVAC systems and Piping systems. They are: 1) "Project W-314 DST & DCRT Tank Farm Electrical Distribution Systems, Initial Assessment", WHC-SD-W314-ES-020; 2) "Project W-314 DST & DCRT Tank Farm Ventilation Systems, Initial Assessment", WHC-SD-W314-ES-022; 3) "Project W-314 Mechanical Systems Upgrades, Initial Assessment", WHC-SD-W314-ES-021.

The data arranged in the many sections of this document are primarily arranged by Facility. The first six sections contain the Double Shell Tank Farm Findings arranged in alphabetic order. Other facilities such as the DCRTs, Pipelines, etc follow. Each section contains data and narrative as specified in the "Table and Narrative Descriptions" section. The Engineering Analysis, contained in Section 13, covers all the Tank Farms by system. In most cases, the system designs are virtually identical. Differences in the Instrumentation and Control Systems design between the various Tank Farm facilities are called out in the Engineering Analysis.

TABLE AND NARRATIVE DESCRIPTIONS

The following describes the tables, narratives and data sheets which capture the results of the various Facility Hardware Analysis Methods.

PDRD CROSS REFERENCE TABLE

The PDRD Cross Reference Table contains references to all identified sections in the PDRD which apply to the hardware systems that were assessed. It is "keyed" to the PDRD functions via the PDRD legal numbering system. It establishes whether hardware exists to provide a related PDRD function or it indicates when architecture does not exist to provide the related function. It also helps to assure that all pertinent items in the PDRD are addressed. A comments column briefly describes exceptions or unique attributes, if required.

FUNCTIONS ASSESSMENT TABLES

This table identifies plant hardware Systems, Structures or Components (SSC) and the applicable portions of the PDRD that apply. This table is derived from the architecture tree (system) block diagrams and is "keyed" to it using the unique Block Diagram Identifier. The function of the existing SSC is compared to the PDRD and other known requirements. A YES/NO assessment is made for that SSC. This is entered in the "MET" subcolumn under the "FUNCTIONS OR CONSTRAINT" column. The methods used to make the analysis which led to this determination are indicated in the adjacent

column "METHOD OF ANALYSIS". A brief comment is made as to the reason(s) that a YES or NO is entered in the "MET" column. Full details are available in the referenced "METHODS OF ANALYSIS" column.

EQUIPMENT ARCHITECTURE TREE BLOCK DIAGRAM

The Equipment Architecture Tree Block Diagrams are a hierarchical structured decomposition model of the system, structure or component (SSC) which is being assessed. Each block (decomposition) depicts a system or subsystem level or a final end item. The organization of the block diagram is derived from the existing engineering media, ie SARs, drawings, safety equipment lists, etc. The amount of decomposition was determined in such a manner as to give good guidance to the field inspection activity. Each block is keyed to a tank farm or major facility and has a unique reference alphanumeric identifier which is a breakdown of the prior (higher) level. **All assessment data are "keyed" to these identifiers in the architectural tree block diagrams.**

SYSTEMS DRAWING REFERENCES TABLES

This table contains references to the architectural tree (system) block diagram identifiers and corresponding references to Engineering Design Media. It provides a way to verify and trace the model to the existing hardware. It is "Keyed" to the numbering system of the architectural tree block diagrams.

SPECIAL TESTING

This part contains specifications for special testing of SSC and the corresponding results. It references appropriate Supporting Document, if applicable.

FIELD ASSESSMENT QUESTIONNAIRE TABLE

These tables provides a list of questions that elicit additional information over that which is normally obtained during the Condition Assessment Survey (CAS). The table is derived from the "Requirements Assessment Table". Findings may consist of the Inspectors observations, or the results of conversations with Maintenance and Operations staff. The source and credentials of the source of these statements (derived by interview) are entered along with the findings into the column "FINDINGS/COMMENTS".

Summary narrative may also be included in this section as supplied by the CAS Inspectors.

CONDITION ASSESSMENT I SURVEY (CAIS) DATA SHEETS & NARRATIVES

This section contains the CAS survey system data for the Instrument and Control Systems and detailed reports as generated by the CAS Inspectors. These are "keyed"

to the Architectural Tree (System) Block Diagrams and provide a reference to the equipment (Plant Labeling Nomenclature). In addition to assessment codes, brief statements summarize the condition of the assessed equipment.

Since part of the existing instrumentation system is contained in other systems, additional pertinent CAS assessment information will be found in the companion documentation for the Electrical, HVAC and Piping Systems.

CAPITAL ASSET MANAGEMENT PROCESS (CAMP) RATING PROGRAM WORKSHEETS

This subsection contains the EXCEL worksheets which result from the CAMP process. The "CAMP Project Title" is an abbreviation of the System or Subsystem that has been assessed. The "CAMP Project Id#" is keyed to the Architecture Tree numbering system.

ENGINEERING ANALYSIS METHOD

This section contains an Engineering Analysis of the assessed system and is "keyed" to the Architectural Tree identification numbers. It is based on suspected Regulatory Compliance Issues, known maintenance problems and operational deficiencies, and a review of the Engineering Drawings. It takes its lead from other Supporting Documents which have identified problem areas in the past. This section focuses on the design deficiencies of the Engineered System, but may include references to known performance problem areas.

REFERENCES

References utilized for the preparation of the Engineering Analysis and the various summary tables are summarized in section 14.

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3.0 AN TANK FARM

3.1 PDRD Cross Reference Tables

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PROJECT W-314 PDRD CROSS REFERENCED TABLE INSTRUMENT & CONTROL SYSTEMS				
PDRD FUNCTION ID#	PDRD FUNCTION VERB	PDRD DATA VARIABLE	EQUIPMENT REFERENCE TABLE	COMMENTS
3.2.1.1.1.1	Monitor	Hydroxide conc. Nitrate concentration Nitrite concentration Sodium concentration Specific Gravity	Non-existent architecture Non-existent architecture Non-existent architecture Non-existent architecture AN.I4.3.1	Manual Sampling, Lab. Analysis function Tank 107-AN has a new Enraf density monitoring instrument installed.
3.2.1.1.1.1.2	Compare	Hydroxide conc. Nitrate concentration Nitrite concentration	Non-existent architecture Non-existent architecture Non-existent architecture	Lab. Analysis function
3.2.1.1.1.2.1.2	Compare	Specific Gravity	Non-existent architecture	Administrative function, 107-AN Density Monitoring System is just Monitoring.
3.2.1.1.1.2.1.3	Compare	Sodium concentration	Non-existent architecture	Lab. Analysis function
3.2.1.1.1.2.1.4	Compare	Pu concentration	Non-existent architecture	Lab. Analysis function
3.2.1.1.1.3	Alarm	Waste composition	Non-existent architecture	Administrative function
3.2.1.1.1.4	Control	Waste composition	Non-existent architecture	Administrative function
3.2.1.1.1.5	Monitor	Supernate Liquid Level	AN.I4.4.2 AN.I1.7	Old FIC gauges are being replaced with Enraf gauges Old high level probes.
3.2.1.1.1.6	Compare	Supernate Liquid Level	Not Assessed AN.I1.4	Old CASS computer function. Old relays work in Master Pump Shutdown (re: AN.I1.4)
3.2.1.1.1.7	Alarm	Supernate Liquid Level	Not Assessed AN.I1.5	Old CASS computer function. Local Alarm function (re: AN.I1.5)

PROJECT W-314 PDRD CROSS REFERENCED TABLE INSTRUMENT & CONTROL SYSTEMS				
PDRD FUNCTION ID#	PDRD FUNCTION VERB	PDRD DATA VARIABLE	EQUIPMENT REFERENCE TABLE	COMMENTS
3.2.1.1.1.8	Control	Supernate Liquid Level	Non-existent architecture	Administrative function
3.2.1.1.1.9	Monitor	Waste Temperature	AN.14.1	Old Manual Operation.
3.2.1.1.1.10	Compare	Waste Temperature	Not Assessed	Old Manual Input to CASS.
3.2.1.1.1.11	Alarm	Waste Temperature	Not Assessed	Old Output Report from CASS.
3.2.1.1.1.12 3.2.1.2.1.1	Control	Waste Temperature (indirectly) Ventilation System Airflow	Not Assessed re: AN.12.1.5 See HVAC	Administrative function Manual adjustment required
3.2.1.1.1.13	Monitor	Waste Level	AN.14.4.2	Enrafs are replacing the old FIG. See part 3.2.1.1.1.5
3.2.1.1.1.14	Compare	Waste Level	Not Assessed	See 3.2.1.1.1.6
3.2.1.1.1.15	Alarm	Waste Level	Not Assessed	See 3.2.1.1.1.7
3.2.1.1.1.16	Control	Waste Level	No automatic control architecture, re: AN.13.1	Administrative function
3.2.1.1.1.17(.1)	Monitor	Leak Det. Pit Radiation Level	AN.11.1.1	
3.2.1.1.1.17(.1)	Monitor	Leak Det. Pit Temperature	AN.11.1.4, Not Assessed	Suggest deletion and revised PDRD.
3.2.1.1.1.17(.1)	Monitor	Leak Det. Pit Waste Level	AN.11.1.2	
3.2.1.1.1.17(.2)	Monitor	Tank Annulus Radiation Level	AN.11.2.1	
3.2.1.1.1.17(.2)	Monitor	Tank Annulus Liquid Presence/Level	AN.11.2.2	
3.2.1.1.1.18	Compare	Leak Det. Pit Radiation Level	AN.11.1.1.5	

PROJECT W-314 PDRD CROSS REFERENCED TABLE INSTRUMENT & CONTROL SYSTEMS				
PDRD FUNCTION ID#	PDRD FUNCTION VERB	PDRD DATA VARIABLE	EQUIPMENT REFERENCE TABLE	COMMENTS
3.2.1.1.1.18	Compare	Leak Det. Pit Temperature	Not Assessed	Suggest deletion and revised PDRD.
3.2.1.1.1.18	Compare	Leak Det. Pit Water Level	AN.I1.1.2.5	
3.2.1.1.1.18	Compare	Tank Annulus Radiation Level	AN.I1.2.1.4	
3.2.1.1.1.18	Compare	Tank Annulus Liquid Presence/Level	AN.I1.2.2	
3.2.1.1.1.19	Alarm	Leakage From Tank Bottom	AN.I1.2.1.4	
3.2.1.1.1.19	Alarm	Leakage From Tank Annulus	AN.I1.1.2.5 AN.I1.1.1.5	
3.2.1.1.1.20	Control	Leakage From Tank Bottom	Not Assessed re: AN.I3.1 & Leak Det. Pit Pump	Administrative function
3.2.1.1.1.20	Control	Leakage From Tank Annulus	Not Assessed	Administrative function
3.2.1.1.1.21	Monitor	Leak Det. Pit Liquid Level	See 3.2.1.1.1.17(1)	
3.2.1.1.1.22	Compare	Leak Det. Pit Liquid Level	See 3.2.1.1.1.18	
3.2.1.1.1.23	Alarm	Leak Det. Pit Liquid Level	See 3.2.1.1.1	
3.2.1.1.1.24	Control	Leak Det. Pit Liquid Level	AN.I1.1.2.5	
3.2.1.1.1.25	Monitor	Tank Vapor Space Temperature Gradient	AN.I4.1	Old CASS Data Loggers. Partly old manual operation, TMACS has replaced some Data Logger function.

PROJECT W-314 PDRD CROSS REFERENCED TABLE INSTRUMENT & CONTROL SYSTEMS				
PDRD FUNCTION ID#	PDRD FUNCTION VERB	PDRD DATA VARIABLE	EQUIPMENT REFERENCE TABLE	COMMENTS
3.2.1.1.1.26	Compare	Tank Vapor Space Temperature Gradient	Not Assessed	Old CASS operation, TMACS has replaced some Data Logger function.
3.2.1.1.1.27	Alarm	Tank Vapor Space Temperature Gradient	Not Assessed	Old CASS operation, TMACS has replaced some Data Logger function.
3.2.1.1.1.28	Control	Tank Vapor Space Temperature Gradient	Not Assessed re: AN.I2.1.5	Administrative function
3.2.1.1.1.29	Monitor	Tank [Concrete] Structure Temperature	AN.I6.4	Old Data Logger connects to CASS. TMACS has connected selected points.
3.2.1.1.1.30	Compare	Tank [Concrete] Structure Temperature	Not Assessed	Old CASS operation, TMACS has replaced some data logger function.
3.2.1.1.1.31	Alarm	Tank [Concrete] Structure Temperature	Not Assessed	Old CASS operation, TMACS will replace some data logger function.
3.2.1.1.1.32 3.2.1.2.1.1.2	Control	Tank [Concrete] Structure Temperature (indirectly) Ventilation System Airflow	Not Assessed re: AN.I2.1.5	Administrative function
3.2.1.1.1.33	Monitor	Tank Vapor Space Pressure	AN.I2.1.1.2 AN.I2.1.1.5	
3.2.1.1.1.34	Compare	Tank Vapor Space Pressure	AN.I2.1.1.4	
3.2.1.1.1.35	Alarm	Tank Vapor Space Pressure	AN.I2.1.1.4	

PROJECT W-314 PDRD CROSS REFERENCED TABLE INSTRUMENT & CONTROL SYSTEMS				
PDRD FUNCTION ID#	PDRD FUNCTION VERB	PDRD DATA VARIABLE	EQUIPMENT REFERENCE TABLE	COMMENTS
3.2.1.1.1.36	Control	Tank Vapor Space Pressure	Not Assessed re: AN.I2.1.5 & AN.I2.1.6	Administrative function.
3.2.1.1.1.37	Monitor	Tank Flammable Gas Concentration	AN.I4.2, Not Assessed	New System (SHMS)
3.2.1.1.1.38	Compare	Tank Flammable Gas Concentration	AN.I4.2, Not Assessed	New System (SHMS)
3.2.1.1.1.39	Alarm	Tank Flammable Gas Concentration	AN.I4.2, Not Assessed	New System (SHMS)
3.2.1.1.1.40 3.2.1.2.4 3.2.1.2.5	Control (Maintain, Adjust)	Tank Flammable Gas Concentration Tank Ventilation System Airflow	Not Assessed re: AN.I2.1.5 & AN.I2.1.6	Administrative function. A Trade Study should assess the need for a tie-in to the new HVAC control system.
3.2.1.1.1.41	Monitor	Untreated Gaseous Effluent Temperature	AN.I2.1.3	Also see AN.I2.1.4, Heater Control System
3.2.1.1.1.42	Monitor	Treated Gaseous Effluent Radionuclide Particulate Concentrations	AN.I2.1.8	
3.2.1.1.1.42	Monitor	Treated Gaseous Effluent Temperature	AN.I2.1.8	
3.2.1.1.1.42	Monitor	Treated Gaseous Effluent Moisture level	Non-existent architecture	

PROJECT W-314 PDRD CROSS REFERENCED TABLE INSTRUMENT & CONTROL SYSTEMS				
PDRD FUNCTION ID#	PDRD FUNCTION VERB	PDRD DATA VARIABLE	EQUIPMENT REFERENCE TABLE	COMMENTS
3.2.1.1.1.42	Monitor	Treated Gaseous Effluent Organic Vapor Concentration	Non-existent architecture	
3.2.1.1.1.42	Monitor	Treated Gaseous Effluent Hazardous/ Toxic Vapor - Particulate Concentrations	Non-existent architecture	
3.2.1.1.1.43(1)	Compare	Treated Gaseous Effluent Radionuclide Particulate Concentrations	AN12.1.8 See HVAC Assessment	
3.2.1.1.1.43	Compare	Treated Gaseous Effluent Temperature	AN12.1.8	
3.2.1.1.1.43	Compare	Treated Gaseous Effluent Moisture Level	Non-existent architecture	
3.2.1.1.1.43	Compare	Treated Gaseous Effluent Organic Vapor Concentration	Non-existent architecture	
3.2.1.1.1.43(2)	Compare	Treated Gaseous Effluent Hazardous/ Toxic Vapor - Particulate Concentrations	Non-existent architecture	

PROJECT W-314 PDRD CROSS REFERENCED TABLE INSTRUMENT & CONTROL SYSTEMS				
PDRD FUNCTION ID #	PDRD FUNCTION VERB	PDRD DATA VARIABLE	EQUIPMENT REFERENCE TABLE	COMMENTS
3.2.1.1.1.44	Alarm	Treated Gaseous Effluent Radionulide Particulate Concentrations	AN.12.1.8	
3.2.1.1.1.44	Alarm	Treated Gaseous Effluent Temperature	Not Assessed	
3.2.1.1.1.44	Alarm	Treated Gaseous Effluent Moisture Level	Non-existent architecture	
3.2.1.1.1.44	Alarm	Treated Gaseous Effluent Organic Vapor Concentration	Non-existent architecture	
3.2.1.1.1.44	Alarm	Treated Gaseous Effluent Hazardous/ Toxic Vapor - Particulate Concentrations	Non-existent architecture	
3.2.1.1.1.45	Control	Treated Gaseous Effluent Radionulide Particulate Concentrations	Not Assessed re: AN.12.1.5 & AN.12.1.6	Administrative function.
3.2.1.1.1.45	Control	Treated Gaseous Effluent Temperature	Not Assessed	Administrative function.

PROJECT W-314 PDRD CROSS REFERENCED TABLE INSTRUMENT & CONTROL SYSTEMS				
PDRD FUNCTION ID#	PDRD FUNCTION VERB	PDRD DATA VARIABLE	EQUIPMENT REFERENCE TABLE	COMMENTS
3.2.1.1.1.45 3.2.1.2.7	Control	Treated Gaseous Effluent Moisture Level (indirectly) Tank Ventilation System	Non-existent architecture	Administrative function.
3.2.1.1.1.45	Control	Treated Gaseous Effluent Organic Vapor Concentration	Non-existent architecture	Administrative function.
3.2.1.1.1.45 3.2.1.2.8	Control	Treated Gaseous Effluent Hazardous/ Toxic Vapor - Particulate Concentrations (indirectly) Tank Ventilation System	Non-existent architecture	Administrative function.
3.2.1.1.2.2	Monitor	Essential Transfer Tank Systems/Equipment Operability Status (eg. vent. sys., waste level monitor, etc)	Non-existent architecture	Presently, Operator rounds required.
3.2.1.1.2.3	Monitor	Essential Interconnecting Systems/Equipment Operability Status (eg. heat trace, valves, pumps, etc)	AN.I1.6, Not Assessed	Presently, Operator rounds required.
3.2.1.1.2.4	Monitor	Transfer System Operability Status (leak detection system	AN.I1.3 AN.I1.4	Presently, Operator rounds required.

PROJECT W-314 PDRD CROSS REFERENCED TABLE INSTRUMENT & CONTROL SYSTEMS				
PDRD FUNCTION ID#	PDRD FUNCTION VERB	PDRD DATA VARIABLE	EQUIPMENT REFERENCE TABLE	COMMENTS
3.2.1.1.2.5	Monitor	Essential Equipment Operability Status	AN.I6	Presently, Operator rounds required.
3.2.1.1.2.6	Monitor	Waste Parameters Temperature Viscosity Specific Gravity	AN.I4 AN.I4.1 AN.I4.3	SpG monitoring available only for 107-AN.
3.2.1.1.2.7	Detect	Waste Transfer System Containment Leaks	AN.I1.3	
3.2.1.1.2.8	Monitor	Effluents	Non-existent architecture	No effluents in the Tank Farm. Service pit monitors water flow utilized for washdown.
3.2.1.1.2.9	Monitor	Motive Force	See Electrical Assessment (re: AN.I3.1)	Manual ON-OFF controls, local indicators of ON-OFF condition.
3.2.1.1.2.9	Control	Motive Force	See Electrical Assessment (re: AN.I3.1)	Manual ON-OFF controls
3.2.1.1.2.10	Monitor	Transfer Route Isolation Devices	I&C Non-existent architecture (re: AN.I3.3) See Pipeline Assessment	Manual Indication
3.2.1.1.2.10	Control	Transfer Route Isolation Devices	I&C Non-existent architecture, (re: AN.I3.3) See Pipeline Assessment	Manual Operation.
3.2.1.1.2.11	Monitor	Transfer Line Waste Flow Rate	Non-existent architecture	
3.2.1.1.2.12	Monitor & Compare (Verify)	Transfer Volume	Non-existent architecture	Administrative function.
3.2.1.1.2.13	Alarm (Annunciat e)	Waste Transfer System-Structure- Component Fault(s)	AN.I1.5	Administrative function. Alarm Status assessed via Operator rounds & via CASS reports.

PROJECT W-314 PDRD CROSS REFERENCED TABLE INSTRUMENT & CONTROL SYSTEMS				
PDRD FUNCTION ID#	PDRD FUNCTION VERB	PDRD DATA VARIABLE	EQUIPMENT REFERENCE TABLE	COMMENTS
3.2.1.1.14	Control (Activate)	Waste Transfer Safe Shutdown Systems	AN.11.4	
3.2.1.1.2.15	Monitor & Compare (Verify)	Waste Transfer System Safe Shutdown	Non-existent architecture	Function not implemented with I & C.
3.2.1.1.2.16	Control (Secure)	Failed Waste Transfer System Equipment	Non-existent architecture	Function not implemented with I & C.
3.2.1.1.3	Manage Obtain Analyze Process Store Archive	System Data/Information	Data Acquisition System Not Assessed AN.11.2.1.4 AN.12.1.1.5 AN.11.6 (re: AN.14.4.5)	Chart recorders in 241-AN-271 should be functionally replaced.
3.2.1.2.3.1	Monitor	Tank Annulus Pressure	AN.12.2.1 See HVAC Assessment	Existing equipment is manual.
3.2.1.2.3.1	Control (Maintain)	Tank Annulus Pressure	Not Assessed re: AN.12.1.5	Manual operator function.
3.2.1.3.4	Monitor	Waste Transfer System Containment Pressure	Non-existent architecture re: AN.13.4 See Pipeline Assessment	
3.2.1.3.4	Control	Waste Transfer System Containment Pressure	Non-existent architecture See Pipeline Assessment	
3.3.1.2.3.1	Monitor	Sludge Volume	AN.14.5 Not Assessed	

PROJECT W-314 PDRD CROSS REFERENCED TABLE INSTRUMENT & CONTROL SYSTEMS				
PDRD FUNCTION ID#	PDRD FUNCTION VERB	PDRD DATA VARIABLE	EQUIPMENT REFERENCE TABLE	COMMENTS
3.3.4.1.6	Monitor	CAMs Radiation Remote Centralized Data & Alarm Display	Not Assessed	Personel protection monitoring is not monitored by TMACS. Local indication only.

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3.2 Functions Assessment Tables

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**EXISTING TANK FARM EQUIPMENT
FUNCTIONS ASSESSMENT TABLE**
INSTRUMENTS & CONTROL SYSTEMS

REF. NO	SYSTEM NAME	FUNCTION OR CONSTRAINT			METHOD OF ANALYSIS I. Analysis II. Inspection III. Testing	BRIEF REASON FOR DECISION
		DESCRIPTION	SOURCE	MET		
AN/1.1	LEAK CONTROL SYSTEM	3.2.1.1.2.4 3.2.3.3 3.2.3.4	PDRD	NO	I. See the Engineering Analysis	Verification of the operability of the transfer route leak sensors is not reliable because of the design of the liquid presence sensors and the manual process utilized to test each sensor. These sensors can not be calibrated.
AN/1.1.1	LEAK DET. PIT/SUMP INST.					
AN/1.1.1.1	Gamma Radiation Monitoring Subsystem	3.2.1.1.1.17	PDRD	NO	I. See the Engineering Analysis. IIa. See Field Inspection Questionnaire. IIb. See CAS Data Sheets.	The instrument thimble often contains water due to condensation and possible rainwater infiltration. The relation between the output indication of this system and leak rate detection is not well defined. Sensor connectors and their cable are sometimes underwater. This system is not designed for submerged use. Cable life expectancy in this environment is poor.
AN/1.1.2	Weight Factor & Specific Gravity Monitoring Subsystem	3.2.1.1.1.17	PDRD	NO	I. See the Engineering Analysis. IIa. See Field Inspection Questionnaire. IIb. See Inst. CAS Data Sheets.	This is complex pneumatic technology that does not directly measure liquid surface level. Better instrumentation exists that does not use instrument air. Potential degradation of inst. air piping may lead to a degradation of inst. air quality with subsequent pneumatic inst. problems. A Trade Study should be carried out to verify need for this architecture.
AN/1.1.3	Liquid Presence Sensor and Buried wiring	3.2.1.1.2.7	1. PDRD, WAC-173-303-#180(4)(c)(iii), 40CFR-CH1-#265.193(c)(3)	NO	I. See the Engineering Analysis. IIa. See Field Inspection Questionnaire. IIb. See Elec & Inst. CAS Data Sheets.	The existing device will not measure low leak rates due to its design. See AN/1.3.3 The wiring in the pits is direct buried. Wiring insulation is cracking in some terminal boxes.
AN/1.1.4	Liquid Temperature Sensor	3.2.1.1.1.17	PDRD	YES	I. See the Engineering Analysis.	Although this device meets PDRD requirements, it could be eliminated as redundant instr. as it adds little value to leak detection.
AN/1.2	ANNULUS LEAK INSTRUMENTATION	Secondary Containment Leak Detection	1. 40CFR-CH1-#265.193(c)(3), WAC-173-303	NO	I. See the Engineering Analysis.	Leakage from secondary tank walls may be absorbed in the soil. Secondary containment floor leaks may be detected by the Leak Detection Pit systems.

EXISTING TANK FARM EQUIPMENT FUNCTIONS ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS						
REF. NO	SYSTEM NAME	FUNCTION OR CONSTRAINT			METHOD OF ANALYSIS I. Analysis II. Inspection III. Testing	BRIEF REASON FOR DECISION
		DESCRIPTION	SOURCE	MET		
AN/J1.2.1	Annulus CAM Radiation Monitoring Subsystem	3.2.1.1.1.17	PDRD, 40CFR-CH1, #265.193(c)(3), WAC-173-303	YES ¹	I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	This system is too sensitive to Radon gas, which yields excessive false alarms. System beta/gamma sensitivity specification is somewhat arbitrary (see WHC-TI-357; 600 CMP = 3 * BASELINE). Maintenance/calibration of the analyzer is difficult because of lifting requirements. A partial upgrade may be appropriate. The data recorder requires extensive maintenance. A Trade Study should be carried out to determine the efficiency of this type of instrument and the appropriateness of this application.
AN/J1.2.2	Liquid Presence Sensor (Flake Box & Manual Tape Conductivity Probe)	3.2.1.1.1.17	1. PDRD, WAC-173-303, #160(4)(c)(iii), 40CFR-CH1, #265.193(c)(3)	NO	I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	The device is manually operated. Thus the level detected is subject to operator interpretation & the resolution is poor. Monitoring Frequency requirements suggest a need for automatic monitoring & recording. This device requires an Operator to enter the farm to operate. This device is a very large consumer of Inst. Air. This device housing is damaged by UV radiation. The basic Design is a problem.
AN/J1.2.3	Annulus Pump Pit Liquid Presence Sensor	3.2.1.1.2.7	PDRD	NO	I. See the Engineering Analysis.	See AN/J1.3.3
AN/J1.3	PIPELINE LEAK INSTRUMENTATION	3.2.1.1.2.7 Secondary Containment Leak Detection	PDRD WAC-173-303, #160(4)(c)(iii) 40CFR-CH1, #265.193(c)(3)	NO	I. See the Engineering Analysis.	The detection system cannot detect a failure of pipeline secondary containment. The detection system cannot detect a failure of the various "Transfer Pits". A Trade Study should pull together the various environmental interpretations, permits and waiver requests to confirm the need for this type of system.

**EXISTING TANK FARM EQUIPMENT
FUNCTIONS ASSESSMENT TABLE**
INSTRUMENTS & CONTROL SYSTEMS

REF. NO	SYSTEM NAME	FUNCTION OR CONSTRAINT			METHOD OF ANALYSIS I. Analysis II. Inspection III. Testing	BRIEF REASON FOR DECISION
		DESCRIPTION	SOURCE	MET		
AN.11.3.1	C.O.B. Liquid Presence Sensor	3.2.1.1.2.7	PDRD WAC-173-303- #160(4)(c)(iii), 40CFR-Ch1- #265.193(c)(3)	NO	I. See the Engineering Analysis. IIb. See Elec. CAS Data Sheets.	The existing sensor will not detect low leak rates due to its design. Its operability cannot be easily verified (manual drenching with water is required) and it cannot be functionally tested with existing electrical circuitry. The wiring installation is direct buried cable. The wiring is not maintainable. Life expectancy for direct buried cable is not greater than 40 years and may be shorter. Current sensitive relays are not (& cannot be) calibrated with the sensor.
AN.11.3.2	Pipeline Pressure Switch Sensor	3.2.1.1.2.10 3.2.1.3.4	PDRD	NO NO	I. See the Engineering Analysis.	It is believed that adequate "status of the route isolation" is not provided for all the transfer routes. This will require an Engineering analysis to determine if more pressure switches are required.
AN.11.3.3	Transfer Pits; Liquid Presence Sensor	3.2.1.1.2.7	PDRD WAC-173-303- #160(4)(c)(iii), 40CFR-Ch1- #265.193(c)(3)	NO	I. See the Engineering Analysis. IIa. See Field Inspection Questionnaire. IIb. See Elec. CAS Data Sheets.	The sensor will not detect low leak rates due to its design. Its operability cannot be easily verified (manual drenching with water is required) and it cannot be functionally tested with existing electrical circuitry. Rain and melting snow infiltration through cover blocks are often causes of false alarms. The terminal boxes that house the field alarm lamps have had their NEMA rating ruined by incorrect modifications. Wiring inside the boxes has badly deteriorated insulation. The wiring installation is direct buried cable. The wiring is not maintainable. Life expectancy for direct buried cable is not greater than 40 years and may be shorter. Current sensitive relays are not (& cannot be) calibrated with the sensor. In the pump pit of tanks with flammable atmosphere, there is a concern that this system may be an ignition source.
AN.11.3.5	Service Pit Instruments (UDE only)	3.2.1.1.2.7	PDRD	NO	See AN.11.3.3	See AN.11.3.3

**EXISTING TANK FARM EQUIPMENT
FUNCTIONS ASSESSMENT TABLE**
INSTRUMENTS & CONTROL SYSTEMS

REF. NO	SYSTEM NAME	FUNCTION OR CONSTRAINT			METHOD OF ANALYSIS I. Analysis II. Inspection III. Testing	BRIEF REASON FOR DECISION
		DESCRIPTION	SOURCE	MET		
AN11.4	PUMP PERMISSIVE INSTRUMENTATION (241-AN-271 Master Pump Shutdown Relay Panel)	3.2.1.1.2.9 3.2.1.1.2.10 3.2.1.3.10	PDRD	NO	I. See the Engineering Analysis.	The existing system does not allow interlock versatility. (Its all or nothing.) You can not set up a transfer route and have only the appropriate leak sensors for that route active.
AN11.4.4	[242-A Relay Panel]	3.2.1.1.2.9 3.2.1.1.2.10 3.2.1.3.10	PDRD	NO	I. See the Engineering Analysis.	This system ties all the East Area tank farms together and does not allow interlock versatility. (Its all or nothing.) You can not easily isolate farms for a waste transfer route and have only the appropriate leak sensors for that route active.
AN11.5	LOCAL ALARM ANNUNCIATION & ALARM PANELS (241-AN-271 & 242-A)	3.2.1.1.2.2 3.2.1.1.2.3 3.2.1.1.2.4 3.2.1.1.2.5 3.2.1.1.2.13 3.2.1.1.1.3	PDRD	NO	I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	System indicators, in general, do not appear to comply with NUREG-0700 design guidelines which deal with alarm identification. Replacement of the leak detection & M.P.S. systems may render part of the old Instrument Building PANALARM non-functional. re: AN11.3.4. The terminal boxes that house the field alarm lamps have had their NEMA function ruined by incorrect modifications. They are no longer weather tight and badly leak rainwater re: AN11.5.3 This system relies on old (~17 yrs) Hanford designed communications equipment to interface to the CASS system. It is obsolete and parts procurement is difficult.
AN11.6	REMOTE ALARM SIGNALING (GAMEWELL LOOP)	3.2.1.1.3	PDRD	NO	I. See the Engineering Analysis. IIa. See Field Inspection Questionnaire.	This Signaling system does not allow identification of individual leak sensing elements. The system has a long history of maintenance problems. It is obsolete and parts procurement is difficult.

**EXISTING TANK FARM EQUIPMENT
FUNCTIONS ASSESSMENT TABLE**
INSTRUMENTS & CONTROL SYSTEMS

REF. NO	SYSTEM NAME	FUNCTION OR CONSTRAINT			METHOD OF ANALYSIS I. Analysis II. Inspection III. Testing	BRIEF REASON FOR DECISION
		DESCRIPTION	SOURCE	MET		
AN11.7	TANK WASTE HIGH LEVEL ALARM SUBSYSTEM	3.2.1.1.1.5	PDRD	NO	I. See the Engineering Analysis.	Verification of the operability of these high level sensors is not reliable because of the design of the liquid presence sensor. These sensors can not be calibrated. In tanks with flammable atmosphere there is concern that this system may be an ignition source. The wiring installation is direct buried cable. The wiring is not maintainable. Life expectancy for direct buried cable is not greater than 40 years and may be shorter. Current sensitive relays are not (& cannot be) calibrated with the sensor.
AN12	VENTILATION CONTROL SYSTEM					
AN12.1	TANK PRIMARY VENTILATION SYSTEM					
AN12.1.1	Tank Diff. Pressure Instr. Subsystem	3.2.1.1.1.33 3.2.1.1.1.34 3.2.1.1.1.35	PDRD	NO	I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	This equipment is obsolete and uses pneumatics to measure and transmit pressure data. The instrument air system has air quality problems which may cause unreliable performance. Future procurement of spare parts may be difficult because the technology is outdated. Old chart recorders do not connect to Electronic Database directly, thus record keeping requires handling paper strips. Archival of pressure data requires pasting into Supporting Documents. Automatic data acquisition should be considered. Renovation of the cabinet should be considered for upgrade work.
AN12.1.2	HEPA Filter Diff. Pressure Instr.	3.2.1.2.9 3.2.3	PDRD	NO	I. See the Engineering Analysis.	Record keeping of filter degradation requires manual data gathering. No electronic database capability is available. Automatic data acquisition should be considered.

**EXISTING TANK FARM EQUIPMENT
FUNCTIONS ASSESSMENT TABLE**
INSTRUMENTS & CONTROL SYSTEMS

REF. NO	SYSTEM NAME	FUNCTION OR CONSTRAINT			METHOD OF ANALYSIS I. Analysis II. Inspection III. Testing	BRIEF REASON FOR DECISION
		DESCRIPTION	SOURCE	MET		
AN12.1.3	Temperature Instrumentation	3.2.1.1.1.41 3.2.3	PDRD	NO	See below.	Record keeping of temperature data requires manual data gathering. No electronic database capability is available. Automatic data acquisition should be considered.
AN12.1.4	Heater Control Subsystem	3.2.1.1.1.41	PDRD	NO	I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	Heater controls require extensive maintenance, and cannot be calibrated. Thermostats have high failure rates. Automatic data acquisition should be considered.
AN12.1.5	Fan-Motor Control Subsystem	3.2.1.2.9 3.2.1.2.10 3.2.3	PDRD	YES ¹	See HVAC assessment.	'Automatic data acquisition for control position should be considered.
AN12.1.6	Damper Control Subsystem	3.2.1.2.10	PDRD	YES ¹	See HVAC assessment.	Damper actuators and linkages are in poor condition on K2.5-2 system. 'Automatic data acquisition for control position should be considered.
AN12.1.8	Regulated Stack Monitoring System	3.2.1.1.1.42 Inst. Sensitivity (DCG)	PDRD WHC-SD-EN-TL-288	NO	I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	System does not comply with WDOE requirements.
AN12.2	TANK ANNULUS VENTILATION SYSTEM					(See HVAC section.)
AN12.2.1	Annulus Diff. Pressure Inst. Subsystem	3.2.1.2.3.1	PDRD	NO	I. See the Engineering Analysis.	The existing system is manually read in the farm. The interaction between the primary ventilation system and the annular ventilation on the primary tank wall must be manually computed.
AN13	TRANSFER LINE CONTROL SYSTEM	3.2.1.1.2.5 3.2.1.1.2.8	PDRD	NO	I. See the Engineering Analysis.	Effluents are not monitored.
AN13.1	PUMP CONTROL SUBSYSTEM	3.2.1.1.2.9	PDRD	NO	I. See the Engineering Analysis.	Monitoring of Motive Force Devices is minimal, eg. no current monitoring is carried out.

**EXISTING TANK FARM EQUIPMENT
FUNCTIONS ASSESSMENT TABLE**
INSTRUMENTS & CONTROL SYSTEMS

REF. NO	SYSTEM NAME	FUNCTION OR CONSTRAINT			METHOD OF ANALYSIS I. Analysis II. Inspection III. Testing	BRIEF REASON FOR DECISION
		DESCRIPTION	SOURCE	MET		
AN13.2	VALVE POSITION INSTRUMENTATION - INDICATION (No automation)	3.2.1.1.2.10	PDRD	NO	I. See the Engineering Analysis.	Electronic Feedback of route isolation status does not exist. Transfer route identification cannot be electronically verified because valve position is not remotely monitored. Limit switches are problematic, but new technology exists which could provide continuous position indication.
AN13.3	VALVE CONTROL SYSTEM	3.2.1.1.2.10	PDRD	NO	I. See the Engineering Analysis.	Motorized valve control does not exist.
AN13.4	PRESSURE SWITCH INSTRUMENTATION (Flow Indication)	3.2.1.1.2.9	PDRD	NO	I. See the Engineering Analysis.	Requirements for pipeline pressure sensor for monitoring misrouting is not clearly defined in the PDRD. Transfer route identification cannot be electronically verified because all pipelines are not monitored for pressure or flow. The PDRD should clarify which pipelines require this data function.
AN13.5	WASTE FLOW MONITORING INSTRUMENTATION (Service Pit & Flush Pit)	3.2.1.1.2.11	PDRD	NO	I. See the Engineering Analysis.	Waste Flow Instrumentation, in general, does not exist. The PDRD should more clearly specify which pipelines should have this measurement function.
AN13.5.1	Service Pit Instrument Subsystems					
AN13.5.1.1	Flow Monitor & Totalizer	3.2.1.1.2.11	PDRD	NO	I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	The flow totalizer cannot detect small flow rates (less than 5 gpm).
AN13.5.1.2	Radiation (Gamma) Monitor					Not Assessed. The PDRD does not clearly define this function.
AN13.5.1.3	Pipeline Pressure	3.2.1.1.2.9	PDRD		Relates to AN13.4	Not Assessed.
AN14	TANK CONTENTS MONITORING SYSTEM	3.2.1.1.2.6	PDRD	NO	I. See the Engineering Analysis.	In most cases, real time monitoring systems for these parameters do not exist, i.e. viscosity, specific gravity, etc.

**EXISTING TANK FARM EQUIPMENT
FUNCTIONS ASSESSMENT TABLE**
INSTRUMENTS & CONTROL SYSTEMS

REF. NO	SYSTEM NAME	FUNCTION OR CONSTRAINT			METHOD OF ANALYSIS I. Analysis II. Inspection III. Testing	BRIEF REASON FOR DECISION
		DESCRIPTION	SOURCE	MET		
AN14.1	TEMPERATURE/VAPOR INSTRUMENTATION	3.2.1.1.1.9 3.2.1.1.1.25 3.2.1.2.1.1.7	PDRD	NO ¹	I. See the Engineering Analysis.	'A partial upgrade may be required. Temperature trees that do not have removable sensors are candidates for replacement. These types of temperature Trees can not be repaired. MITs are designed to last 30 years. Note: All existing trees cannot withstand mixer pump forces.
AN14.2	STANDARD HYDROGEN MONITORING SYSTEM	3.2.1.1.1.37	PDRD	YES	System is new. Not Assessed.	SHMS requires purge nitrogen. If the purge gas is switched to instrument air, there is an air quality issue.
AN14.3	CHEMICAL COMPOSITION INSTRUMENTATION	3.2.1.1.1.1 3.2.1.1.1.2.1.1 3.2.1.1.1.2.1.2	PDRD	NO	I. See the Engineering Analysis.	A real time chemical analyzer does not exist. This is a manual sampling effort, analysis is by laboratory & is infrequently done. The PDRD should clarify the requirement for this type of system.
AN14.3.1	107-AN SPECIFIC GRAVITY INSTRUMENTATION	3.2.1.1.1.2.1.2	PDRD	NO	I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	This equipment is new. The PDRD should reassess the need for this real-time monitoring system for any and all tanks.
AN14.4	TANK LIQUID SURFACE LEVEL INSTRUMENTATION (Enraf is scheduled to be installed in this farm soon.)	3.2.1.1.1.5 3.2.1.1.1.13 3.2.1.1.2.1.2	PDRD	NO	I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	This device must satisfy the need for Mass Balance & Tank Inventory measurements. This device is used to detect/confirm liquid leaks and liquid intrusions. The existing FIC gauges achieve poor resolution and require extensive maintenance. The Enraf device were not assessed at this time. However, the Enraf CIU will be required to send digital data directly to TMACS Central in order to remotely report a full range (top level) in tank to bottom of tank).

**EXISTING TANK FARM EQUIPMENT
FUNCTIONS ASSESSMENT TABLE**
INSTRUMENTS & CONTROL SYSTEMS

REF. NO	SYSTEM NAME	FUNCTION OR CONSTRAINT			METHOD OF ANALYSIS I. Analysis II. Inspection III. Testing	BRIEF REASON FOR DECISION
		DESCRIPTION	SOURCE	MET		
AN14.5	SLUDGE WEIGHT (LEVEL) MONITORING	3.2.1.1.1.1	PDRD	YES	I. See the Engineering Analysis.	This device is expensive to fabricate. It requires an Operator to enter the farm to operate. The level data obtained is subject to Operator interpretation and the resolution is poor. A Trade Study should determine if this device should be automated.
AN15	TANK CONTENTS MIXING SYSTEMS	Not in PDRD			I. See the Engineering Analysis.	This function is missing from the PDRD and should be added.
AN15.1	AIR LIFT CIRCULATOR CONTROL SYSTEM	Not in PDRD				
AN15.1.1	DIFF. PRESSURE SENSORS	Not in PDRD			I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	These sensors are manually read. A Trade Study should determine if the data acquisition should be automated.
AN16	SCC STATUS/MONITORING SYSTEM AC POWER SUPPLY STATUS AIR SUPPLY STATUS WATER SUPPLY STATUS HEAT TRACE SYS. STATUS CATHODIC PROT. SYS. STATUS Other	3.2.1.1.2.1 3.2.1.1.2.3	PDRD	NO	I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	A status summary alarm panel for all these subsystems doesn't exist. Some status are available on the old PANALARM panels, some of the data is obtained by Operator rounds. Replacement of the various instrument systems may render much of the old PANALARM non-functional.
AN16.4	TANK CONCRETE STRUCTURE TEMPERATURE INST.	3.2.1.1.1.29 3.2.1.2.1.1.2	PDRD	NO	I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	The data loggers are obsolete. Spare parts procurement are problem. The new TMACS design will provide some monitoring of these Thermocouples. The PDRD should specify which thermocouples require real-time monitoring.
AN17	HEAT TRACE CONTROL SYSTEM	3.2.1.3	PDRD	NO	I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	Some of the Transfer Lines have broken heat traces. The PDRD should reassess the need for this system.

EXISTING TANK FARM EQUIPMENT FUNCTIONS ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS						
REF. NO	SYSTEM NAME	FUNCTION OR CONSTRAINT			METHOD OF ANALYSIS I. Analysis II. Inspection III. Testing	BRIEF REASON FOR DECISION
		DESCRIPTION	SOURCE	MET		
AN 18	CATHODIC PROTECTION SYSTEM	3.2.1.3.5 Testing requirement	PORD WAC-173-303#640	NO ¹	I. See the Engineering Analysis.	The existing system doesn't seem to comply with the testing capability requirements for cathodic protection systems i.a.w. WAC. A partial upgrade may be appropriate.

3.3 Architecture Tree Tables

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Level 1

Level 2

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Level 2

Level 3

Level 3

Level 2

LEAK CONTROL
SYSTEM
AN.11

Level 3

LEAK DETECTION
PIT/SUMP
INSTRUMENTATION
AN.11.1

Level 4

Gamma Radiation
Monitoring
Subsystem
AN.11.1.1

Weight Factor &
Specific Gravity
Monitoring Subsystem
AN.11.1.2

Liquid Presence
Sensor
AN.11.1.3

Liquid Temperature
Sensor
AN.11.1.4

Level 2

Level 3

Level 4

Level 5

Level 2

Level 3

Level 4

Level 5

Level 2

Level 3

Level 4

Level 2

LEAK CONTROL
SYSTEM
AN.1.1

Level 3

ANNULUS LEAK
INSTRUMENTATION
AN.1.1.2

Level 4

CAM Radiation
Monitoring
Subsystem
AN.1.1.2.1

Level 5

Air Sampler
Probe/Tubing/etc
AN.1.1.2.1.1

Radiation
Analyzer
AN.1.1.2.1.2

Cabinet
(Vent. Pit)
AN.1.1.2.1.3

3-Pen Recorder
& Alarms
(241-AN-271)
AN.1.1.2.1.4

Signal
Wiring/Conduit
AN.1.1.2.1.5

Level 2

Level 3

Level 4

Level 2

LEAK CONTROL
SYSTEM
AN.11

Level 3

PIPELINE LEAK
INSTRUMENTATION
AN.11.3

Level 4

Transfer Pit
Instrumentation
AN.11.3.3

Level 5

Pit
Liquid Presence
Sensor
AN.11.3.3.1

Pit
Control Station
AN.11.3.3.2

Signal
Wiring/Conduit/
Terminal Boxes
AN.11.3.3.3

Level 2

Level 3

Level 4

Level 2

Level 3

Level 4

Level 2

Level 3

Level 4

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Level 4

Level 4

Level 2

Level 3

Level 4

Level 5

Level 2

Level 3

Level 4

Level 5

Level 2

VENTILATION
CONTROL SYSTEM
AN.12

Level 3

TANK ANNULUS
VENTILATION
SYSTEM
AN.12.2

Level 4

Annulus
Diff. Pressure
Inst. Subsystem
AN.12.2.1

Level 2

Level 3

Level 2

TRANSFER LINE
CONTROL SYSTEM
AN.13

Level 3

SERVICE PIT
INSTRUMENT
SUBSYSTEMS
AN.13.5

Level 4

Flow Monitor
&
Totalizer
AN.13.5.1

Radiation
(Gamma)
Monitor
AN.13.5.2

Pipeline
Pressure
Sensor
AN.13.5.3

Level 2

Level 3

Level 3

Level 2

Level 3

Level 4

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3.4 Drawing Reference Tables

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EXISTING TANK FARM EQUIPMENT SYSTEM DRAWING REFERENCES INSTRUMENTS & CONTROL SYSTEMS				
REF NO.	SYSTEM NAME	DRAWING REFERENCES	NO. OF ECNs OUTSTANDING	PDRD REFERENCE
AN.II.1	LEAK CONTROL SYSTEM	H-14-020601 (H-2-71944/45), H-14-020601 (H-2-71944/45), H-2-71930	0	1. 3.2.1.1.2.4
AN.II.1.1	LEAK DET. PIT/SUMP INST.	H-14-020601 (H-2-71944/5), H-14-020601 (H-2-71944/5)	0	
AN.II.1.1.1	Gamma Radiation Monitoring Subsystem	H-14-020601 (H-2-71944/5), H-14-020601 (H-2-71944/5)	0	1. 3.2.1.1.1.17
AN.II.1.1.1.1	Gamma Probe Well Structure	H-2-71905	0	
AN.II.1.1.2	Gamma Probe & Well Cable			
AN.II.1.1.3	Field Signal Cable	H-2-71932	8	
AN.II.1.1.4	reserved			
AN.II.1.1.5	Count Rate Meters/ Alarm comparators.	H-2-71956	0	
AN.II.1.2	Weight Factor & Specific Gravity Monitoring Subsystem	H-14-020601 (H-2-71945), H-14-020601 (H-2-71945)	0	1. 3.2.1.1.1.17
AN.II.1.2.1	Sample Tubes (Leak Det. Pit)	H-2-71905	0	
AN.II.1.2.2	Weight Factor & Specific Gravity Pressure Sensors	H-14-020601 (H-2-71945), H-14-020601 (H-2-71945), H-2-71948	2	
AN.II.1.2.3	Weight Factor Cabinet (Xmitter Enclosure)	H-2-71948	2	
AN.II.1.2.4	Field Tubing	H-2-71948	2	
AN.II.1.2.5	W.F. & SpG Pressure Switches & Indication (Inst. Panel & Press. SW Rack)	H-2-71966	1	
AN.II.1.3	Liquid Presence Sensor and Buried wiring	N/A		1. 3.2.1.1.1.17
AN.II.1.4	Liquid Temperature Sensor	H-14-020601 (H-2-71945), H-14-020601 (H-2-71945)	0	1. 3.2.1.1.1.17
AN.II.2	ANNULUS LEAK INSTRUMENTATION	H-14-020601 (H-2-71945), H-14-020601 (H-2-71945), H-2-71947	2	1. Secondary Containment Leak Detection
AN.II.2.1	Annulus CAM Radiation Monitoring Subsystem	H-2-71946	1	1. 3.2.1.1.1.17
AN.II.2.1.1	Air Sampler Probe/ Tubing/ etc	H-2-92976	2	
AN.II.2.1.2	Radiation Analyzer	H-2-92976	2	

EXISTING TANK FARM EQUIPMENT SYSTEM DRAWING REFERENCES INSTRUMENTS & CONTROL SYSTEMS				
AN.11.2.1.3	Cabinet (Vent. Pit)	H-2-92976	2	
AN.11.2.1.4	3-Pen recorder & Alarms (241-AN-271)	H-2-71956	0	
AN.11.2.1.5	Signal Wiring/ Conduit	H-2-71932	8	
AN.11.2.2	Annulus Liquid Presence Sensor (Flake Box & Manual Tape Conductivity Probe)	H-2-72030, H-2-34965, H-2-71947	2	1. 3.2.1.1.1.1.7
AN.11.2.3	Annulus Pump Pit Liquid Presence Sensor	H-2-72030, H-2-34965	0	
AN.11.3	PIPELINE LEAK INSTRUMENTATION	H-2-71927, H-2-71931, H-2-71930, H-2-71950 (?), H-2-71965 (?)	1	1. 3.2.1.1.2.7 2. Secondary Containment Leak Detection
AN.11.3.1	C.O.B. Liquid Presence Sensor	H-2-34965	0	1. 3.2.1.1.2.7
AN.11.3.2	Pipeline Pressure Switch Sensor	N/A		1. 3.2.1.1.2.10 2. 3.2.1.3.4
AN.11.3.3	Transfer Pits; Liquid Presence Sensor	H-2-72030, H-2-71965 (?)	0	1. 3.2.1.1.2.7
AN.11.3.3.1	Pit Liquid Presence Sensor	H-2-72030	0	
AN.11.3.3.2	Pit Pressure Switch Sensor	N/A		
AN.11.3.3.3	Signal Wiring/Conduit/Terminal Boxes	H-2-71930	0	
AN.11.3.4	Signal Wiring/ Conduit/ Terminal Boxes	H-2-71930	0	
AN.11.3.5	Service Pit Instruments (LDE only)	H-2-71978	3	
AN.11.4	PUMP PERMISSIVE INSTRUMENTATION (Master Pump shutdown)	H-2-71927, H-2-71931	0	1. 3.2.1.1.2.9 2. 3.2.1.1.2.10 3. 3.2.1.3.10
AN.11.4.1	241-AN-271 Master Pump Shutdown Relay Panel			1. 3.2.1.1.2.9 2. 3.2.1.1.2.10 3. 3.2.1.3.10
AN.11.4.3	Signal Wiring/Conduit/TBX	H-2-71932	8	
AN.11.4.4	[242-A Relay Panel]			

EXISTING TANK FARM EQUIPMENT SYSTEM DRAWING REFERENCES INSTRUMENTS & CONTROL SYSTEMS				
AN.11.5	LOCAL ALARM ANNUNCIATION & ALARM PANELS	H-2-71956, H-2-71959, H-2-71962	1	1. 3.2.1.1.2.2 2. 3.2.1.1.2.3 3. 3.2.1.1.2.4 4. 3.2.1.1.2.5 5. 3.2.1.1.2.13 6. 3.2.1.1.3
AN.11.5.1	Alarm Panel (241-AN-271)	H-2-71956, H-2-71959	1	
AN.11.5.2	Tank Farm Alarm Panels	H-2-71967	0	
AN.11.5.3	CASS Alarm Panel Interface	H-2-71550	0	
AN.11.5.4	[242-A Computer Interfaces]			
AN.11.6	REMOTE ALARM SIGNALING (GAMEWELL LOOP)	H-2-71804, H-2-71805	0	3.2.1.1.3
AN.11.7	TANK WASTE HIGH LEVEL ALARM SUBSYSTEM	H-2-71933	0	
AN.11.7.1	Waste Liquid High Level Probe	H-2-71927	0	
AN.11.7.2	Tank Farm Alarm Relays (Current Sensitive Relays)	H-2-71927, H-2-71966	1	
AN.11.7.3	Signal Wiring/Conduit	H-2-71932	8	
AN.12	VENTILATION CONTROL SYSTEM	H-2-71935	2	
AN.12.1	TANK PRIMARY VENTILATION SYSTEM	H-2-71935	2	
AN.12.1.1	Tank Diff. Pressure Instr. Subsystem	H-14-020601 (H-2-71945)	0	1. 3.2.1.1.1.33 2. 3.2.1.1.1.34 3. 3.2.1.1.1.35
AN.12.1.1.1	Tank Riser Tubing to Pressure Sensor/Transmitter	H-2-71948	2	
AN.12.1.1.2	Pressure Sensor/Transmitter	H-2-71948	2	
AN.12.1.1.3	Field Instrument Air Tubing	H-2-71948	2	
AN.12.1.1.4	Pressure Switch/Alarm	H-2-71966	1	
AN.12.1.1.5	Pressure Recorder (241-AN-271)	H-2-71956	0	
AN.12.1.2	HEPA Filter Diff. Pressure Instr.	H-2-71935	2	

EXISTING TANK FARM EQUIPMENT SYSTEM DRAWING REFERENCES INSTRUMENTS & CONTROL SYSTEMS				
AN.12.1.3	Temperature Instrumentation	H-2-71935	2	1. 3.2.1.1.1.41
AN.12.1.4	Heater Control Subsystem	H-2-71927	0	
AN.12.1.5	Fan-Motor Control Subsystem	H-2-71927	0	
AN.12.1.6	Damper Control Subsystem	N/A - MANUAL		
AN.12.1.7	Moisture Monitoring Subsystem			3.2.1.1.1.4.2
AN.12.1.8	Regulated Stack Monitoring System (296-A-27)	H-2-71946, H-2-71954, H-2-71955	2	1. 3.2.1.1.1.42
AN.12.1.8.1	Tubing from Stack to CAMs	H-2-71955	1	
AN.12.1.8.2	CAMS (radiation analyzers)	H-2-71955	1	
AN.12.1.8.3	CAM Cabinets	H-2-71955	1	
AN.12.1.8.4	Vacuum Pumps	H-2-71955	1	
AN.12.1.8.5	Pen Recorder (241-AH-211)	H-2-71956	0	
AN.12.2	TANK ANNULUS VENTILATION SYSTEM	H-2-71935	2	
AN.12.2.1	Annulus Diff. Pressure Inst. Subsystem	H-2-71927	0	3.2.1.2.3.1
AN.13	TRANSFER LINE CONTROL SYSTEM			1. 3.2.1.1.2.5 2. 3.2.1.1.2.8
AN.13.1	PUMP CONTROL SUBSYSTEM	H-2-71927	0	1. 3.2.1.1.2.9
AN.13.2	VALVE POSITION INSTRUMENTATION/ INDICATION	H-2-71978	3	1. 3.2.1.1.2.10
AN.13.3	VALVE CONTROL SYSTEM	H-2-71978	3	1. 3.2.1.1.2.10
AN.13.4	PRESSURE SWITCH INSTRUMENTATION (Flow Indication)	N/A		1. 3.2.1.1.2.9
AN.13.5	SERVICE PIT INSTRUMENT SUBSYSTEMS	H-2-71978	3	1. 3.2.1.1.2.11
AN.13.5.1	Flow Monitor & Totalizer	H-2-71978	3	
AN.13.5.2	Radiation (gamma) Monitor	H-2-71978, H-2-71946	4	
AN.13.5.3	Pipeline Pressure Sensor	H-2-71978	1	
AN.14	TANK CONTENTS MONITORING SYSTEM	H-14-020601 (H-2-71945)	0	1. 3.2.1.1.2.6

EXISTING TANK FARM EQUIPMENT SYSTEM DRAWING REFERENCES INSTRUMENTS & CONTROL SYSTEMS				
AN.I4.1	TEMPERATURE/VAPOR INSTRUMENTATION	H-14-020601 (H-2-71945)	0	1. 3.2.1.1.1.9 2. 3.2.1.1.1.25 3. 3.2.1.2.1.1.1
AN.I4.1.1	Thermocouple Probes	H-14-020601 (H-2-71945), H-2-71949, H-2-71962, H-2-71963	0	
AN.I4.1.2	Multifunction Instrument Tree	N/A		
AN.I4.1.3	Temperature Vapor Probe	N/A		
AN.I4.2	STANDARD HYDROGEN MONITORING SYSTEM	H-2-87275	9	1. 3.2.1.1.1.37
AN.I4.2.1	Gas Flow Instrumentation	H-2-817851, H-2-817853, H-2-822773, H-2-822775	2	
AN.I4.2.2	H ₂ Concentration, Low Range	H-2-817851, H-2-817853, H-2-822773, H-2-822775	2	
AN.I4.2.3	H ₂ Concentration, High Range	H-2-817851, H-2-817853, H-2-822773, H-2-822775	2	
AN.I4.2.4	Gas Temperature	H-2-817851, H-2-817853, H-2-822773, H-2-822775	2	
AN.I4.2.5	3-Pen Recorder	H-2-817851, H-2-817853, H-2-822773, H-2-822775	2	
AN.I4.3	CHEMICAL COMPOSITION MONITORING INSTRUMENTATION			1. 3.2.1.1.1.1 2. 3.2.1.1.1.2.1.1 3. 3.2.1.1.1.2.1.2
AN.I4.3.1	AN-107 Specific Gravity Instrumentation			1. 3.2.1.1.1.2.1.2
AN.I4.4	TANK LIQUID SURFACE LEVEL INSTRUMENTATION	H-14-020601 (H-2-71944/45)	0	1. 3.2.1.1.1.5 2. 3.2.1.1.1.13 3. 3.2.1.1.2.1.2
AN.I4.4.1	FIC Riser Extension	H-2-36382	24	
AN.I4.4.2	FIC Level Sensor	H-2-36382	24	
AN.I4.4.4	FIC Buried Signal Cable	H-2-36378	3	
AN.I4.4.4	Terminal Boxes	H-2-36378, H-2-36382	27	
AN.I4.4.5	CASS Interface	H-2-71801, H-2-71802, H-2-71803	6	
AN.I4.5	SLUDGE WEIGHT (LEVEL) MONITORING	H-2-71950	0	
AN.I5	TANK CONTENTS MIXING SYSTEMS			
AN.I5.1	AIR LIFT CIRCULATOR CONTROL SYSTEM	H-14-020601 (H-2-71944/45)	0	

EXISTING TANK FARM EQUIPMENT SYSTEM DRAWING REFERENCES INSTRUMENTS & CONTROL SYSTEMS				
AN.I5.1.1	Diff. Pressure Sensors	H-14-020601 (H-2-71944/45)	0	
AN.I5.1.2	Local Alarm Indication	H-14-020601 (H-2-71944/45)	0	
AN.I5.2	MIXER PUMP CONTROL SYSTEM	H-2-85351	0	
AN.I5.2.1	Pump Sensors	H-2-85264	2	
AN.I5.2.2	Pump Rotation Variable speed Drive Controller	H-2-85351	0	
AN.I5.2.3	Pump (Impeller) Variable Speed Drive Controller	H-2-85351	0	
AN.I5.2.4	Medicon Interface	H-2-85351	0	
AN.I5.2.5	Mixer Pump (AN-1077)	H-2-85264	2	
AN.I6	SCC STATUS/MONITORING SYSTEM			1. 3.2.1.1.2.1 2. 3.2.1.1.2.3
AN.I6.1	AC POWER SUPPLY STATUS INST.	H-2-71924	0	
AN.I6.2	AIR SUPPLY STATUS INST.			
AN.I6.3	WATER SUPPLY STATUS INST.			
AN.I6.4	TANK CONCRETE STRUCTURE TEMPERATURE INST.	H-14-020501 (H-2-71945), H-2-7962	0	1. 3.2.1.1.1.29 2. 3.2.1.2.1.1.2
AN.I6.4.1	Data Logger (See CASS Assessment)			
AN.I6.4.2	Manual Readout Control Panel	H-2-71956 H-2-71957		
AN.I6.4.3	Signal Wiring/Terminal Boxes	H-2-71932	8	
AN.I6.5	HEAT TRACE SYSTEM STATUS INST.	H-2-71929	1	
AN.I6.6	CATHODIC PROTECTION SYSTEM STATUS INST.			
AN.I7	HEAT TRACE CONTROL SYSTEM	H-2-71928	0	1. 3.2.1.3
AN.I7.1	TEMPERATURE MONITORING SENSORS	H-2-71929	1	
AN.I7.2	TEMP. CONTROLLER SUBSYSTEM	H-2-71929	1	
AN.I7.3	OVER TEMP. CONTROLLER SUBSYSTEM	H-2-71929	1	

EXISTING TANK FARM EQUIPMENT SYSTEM DRAWING REFERENCES INSTRUMENTS & CONTROL SYSTEMS				
AN.I7.4	HEATER CONTACTOR - OTHER WIRING	H-2-71929	1	
AN.I7.5	PIPELINE HEAT TRACE TAPE HEATER	H-2-71929	1	
AN.I8	CATHODIC PROTECTION CONTROL SYSTEM			
AN.I8.1	POWER CONTROLLER			
AN.I8.2	WIRING/CONDUIT/TBX			

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3.5 Special Testing

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3.6 Field Assessment Questionnaire

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REF. NO.	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AN.11	LEAK CONTROL SYSTEM		
AN.11.1	LEAK DET. PIT/SUMP INST.		"WT-LEK-126 leak detector station alarms without any detectable reason, rendering it unreliable for detecting leaks. Maintenance and troubleshooting should be performed to determine the cause of the false alarms and corrective action taken."
AN.11.1.1	Gamma Radiation Monitoring Subsystem		
AN.11.1.1.1	Gamma Probe Well Structure	Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Metal cover plate is not sealed and does leak water, however the majority of water accumulation is caused by condensation".
AN.11.1.1.2	Gamma Probe & Well Cable	Inspect instrument cables where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Cable is RG59 coaxial. Although the cable is sealed with RTV, I&C technicians indicate that cable failure at the connections is constant problem".
AN.11.1.1.3	Field Signal Cable	Inspect instrument cables where accessible. Estimate maintenance repair frequency for equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	
AN.11.1.1.4	reserved		
AN.11.1.1.5	Count Rate Meters/ Alarm comparators.	Inspect instrument cables where accessible. Inspect wiring where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"TBXs and wiring are in good condition". "Estimated age of equipment is 15 years". "Low repair rate". "Calibration on 6 month rotation, performed in the shop at 4 hours per instrument". "No recurrent problems".
AN.11.1.2	Weight Factor & Specific Gravity Monitoring Subsystem		"The quality of the instrument air in AN farm is not monitored".

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REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AN.11.1.2.1	<i>Sample Tubes (Leak Det. Ptl)</i>	Inspect instrument tubing where accessible. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access not allowed at this time"
AN.11.1.2.2	<i>Weight Factor & Specific Gravity Pressure Sensors</i>	Inspect wiring where accessible. Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Estimated age of equipment is 15 years". "Low repair rate". "Calibration on annual rotation, performed in the field at 1 hour per instrument". "No recurrent problems".
AN.11.1.2.3	<i>Weight Factor Cabinet (Xmitter Enclosure)</i>	Inspect equipment and cabinets/terminal boxes for corrosion. Estimate maintenance repair frequency for equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Cabinet doors do not seal properly and/or access latches are not properly closed after maintenance is performed allowing dirt to infiltrate the cabinet.
AN.11.1.2.4	<i>Field Tubing</i>	Inspect instrument tubing where accessible.	"Copper tubing entering the instrument panels in 271AM has no indication of damage or corrosion, farm air lines that could be accessed were in good condition".
AN.11.1.2.5	<i>W.F. & SpG Pressure Switches & Indication (Inst. Panel & Press. SW Rack)</i>	Inspect wiring where accessible. Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	
AN.11.1.3	<i>Liquid Presence Sensor and Buried wiring</i>	Inspect wiring where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access not allowed at this time".

REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AN.11.1.4	Liquid Temperature Sensor	Inspect wiring where accessible. Inspect instrument tubing where accessible. Estimate age of equipment. Determine maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access not allowed at this time".
AN.11.2	ANNULUS LEAK INSTRUMENTATION		
AN.11.2.1	Annulus CAM Radiation Monitoring Subsystem		
AN.11.2.1.1	Air Sampler Probe/ Tubing/ etc	Inspect instrument tubing where accessible. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Probe could not be accessed at this time. Tubing has no signs of corrosion or damage".
AN.11.2.1.2	Radiation Analyzer	Inspect instrument cables where accessible. Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Determine maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Estimated age of equipment is 15 years". "Low repair rate". "Calibration is on an annual rotation, performed in the shop at 4 hours per instrument". "The CAMS weigh in excess of 100 pounds and are hard to access for maintenance or repair".
AN.11.2.1.3	Cabinet (Vent. Pnt)	Inspect equipment and cabinets/terminal boxes for corrosion. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Cabinets are in adequate condition. Door latches are often not sealed properly after maintenance is performed".
AN.11.2.1.4	3-Pen recorder & Alarms (241-AN-271)	Inspect instrument cables where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Determine maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Cable and wiring are in good condition". "Estimated age of equipment is 15 years". "Calibration is on an annual rotation, performed in the field at 1 hour per instrument". "Continual repair action is required and equipment often requires extensive repairs to bring it within calibration tolerances".

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REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AN.I1.2.1.5	Signal Wiring/ Conduit	Inspect instrument cables where accessible. Inspect wiring where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Signal wiring and conduit that could be accessed were in adequate condition with only minor deficiencies noted".
AN.I1.2.2	Annulus Liquid Presence Sensor (Flake Box & Manual Tape Conductivity Probe)	Inspect wiring where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Determine maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Estimated age of equipment is 15 years". "Low repair rate". "No calibration is performed. A functional test is performed monthly". "Terminal boxes exhibited a presence of condensation at some of the Flake boxes. O-ring seals are frequently replaced. Purge air is used at each Flake box".
AN.I1.2.3	Annulus Pump Pit Liquid Presence Sensor	Inspect wiring where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Determine maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Take photographs of equipment to illustrate problem areas.	"Accessed to the sensor could not be arranged at the time of the field assessment. See comments at 1.2.2".
AN.I1.3	PIPELINE LEAK INSTRUMENTATION		
AN.I1.3.1	C.O.B. Liquid Presence Sensor	Inspect wiring where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Determine maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Accessed to the sensor could not be arranged at the time of the field assessment".
AN.I1.3.2	Pipeline Pressure Switch Sensor	Inspect wiring where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Determine maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Accessed to the sensor could not be arranged at the time of the field assessment".
AN.I1.3.3	Transfer Pits: Liquid Presence Sensor		"Accessed to the sensor could not be arranged at the time of the field assessment".

REF. NO.	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AN.II.3.3.1	<i>Pit Liquid Presence Sensor</i>	Inspect wiring where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Accessed to the sensor could not be arranged at the time of the field assessment".
AN.II.3.3.2	<i>Pit Pressure Switch Sensor</i>	Inspect wiring where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Accessed to the sensor could not be arranged at the time of the field assessment".
AN.II.3.3.3	<i>Signal Wiring/Conduit/Terminal Boxes</i>	Inspect wiring where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"TBXs, wiring, and conduit that were accessed during the inspection were in good condition".
AN.II.3.4	Signal Wiring/ Conduit/ Terminal Boxes		
AN.II.3.5	Service Pit Instruments (LDE only)	Inspect wiring where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	
AN.II.4	PUMP PERMISSIVE INSTRUMENTATION (Master Pump shutdown)		
AN.II.4.1	241-AN-271 Master Pump Shutdown Relay Panel	Inspect wiring where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate maintenance repair frequency for equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Wiring is in good condition within relay panel inside 271 building". "Estimated age of equipment is 15 years". "Maintenance history could not be obtained at this time". "No known recurrent problems".
AN.II.4.2	MPS Pushbutton Control Panel		

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REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AN11.4.3	Signal Wiring/Conduit/TBX	Inspect wiring where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"TBXs, wiring, and conduit that were accessed during the inspection were in good condition".
AN11.4.4	[242-A Relay Panel]	Inspect wiring where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"242A evaporator was not included in the field assessments".
AN11.5	LOCAL ALARM ANNUNCIATION & ALARM PANELS		"Local alarm panels within the farm building are in adequate condition including the wiring, terminations, and tubing that could be accessed".
AN11.5.1	Alarm Panel (241-AN-271)	Inspect instrument cables where accessible. Inspect wiring where accessible. Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Take photographs of equipment to illustrate problem areas.	"Local alarm panels within the instrument building are in good condition including the wiring, terminations, and tubing that could be accessed".
AN11.5.2	Tank Farm Alarm Panels	Inspect wiring where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Take photographs of equipment to illustrate problem areas.	"Local alarm panels within the farm building are in adequate condition including the wiring, terminations, and tubing that could be accessed".
AN11.5.3	CASS Alarm Panel Interface	Inspect instrument cables where accessible. Inspect wiring where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"CASS alarm interface was not included in the field assessment".
AN11.5.4	[242-A Computer Interface]		"242A evaporator was not included in the field assessments".

REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AN.11.6	REMOTE ALARM SIGNALING (GAMEWELL LOOP)	Inspect wiring where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	
AN.11.7	TANK WASTE HIGH LEVEL ALARM SUBSYSTEM		
AN.11.7.1	Waste Liquid High Level Probe	Inspect wiring where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Take photographs of equipment to illustrate problem areas.	
AN.11.7.2	Tank Farm Alarm Panels (Current Sensitive Relays)	Inspect wiring where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Alarm panels are in good condition". "Current sensitive relays are not calibrated. Functional tests are performed by the electricians and relays are replaced as they fail".
AN.11.7.3	Signal Wiring/Conduit	Inspect wiring where accessible. Inspect equipment and cabinets/terminal boxes for corrosion.	"Wiring and conduit that were accessed during the inspection were in good condition".
AN.12	VENTILATION CONTROL SYSTEM		
AN.12.1	TANK PRIMARY VENTILATION SYSTEM		
AN.12.1.1	Tank Diff. Pressure Inst. Subsystem		
AN.12.1.1.1	Tank Riser Tubing to Pressure Sensor/Transmitter	Inspect instrument tubing where accessible. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access to the tubing could not be arranged at the time of the assessment".

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REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AN12.1.1.2	<i>Pressure Sensor/Transmitter</i>	Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Estimated age of equipment is 15 years". "Continual repair action required". "Calibration is on an annual rotation, performed in the field at 1 hour per instrument". "Frequent failure of the contacts in the relay and failure of the photo cell".
AN12.1.1.3	<i>Field Instrument Air Tubing</i>	Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Determine known continuous problems (operating or maintenance) with the equipment.	"Field instrument air tubing that could be accessed is in good condition at the exterior surface. Air quality to the instrumentation is not monitored.
AN12.1.1.4	<i>Pressure Switch/Alarm</i>	Inspect wiring where accessible. Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Wiring and tubing is in good condition". "Estimated age of equipment is 15 years". "Low repair rate". "Calibration on annual rotation, performed in the field at 1 hour per instrument". "No recurrent problems".
AN12.1.1.5	<i>Pressure Recorder (241-AN-271)</i>	Inspect wiring where accessible. Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Wiring and tubing is in good condition". "Estimated age of equipment is 15 years". "Continual repair action required". "Calibration is on an annual rotation, performed in the field at 1 hour per instrument". "Continual repair action is required and equipment often requires extensive repairs to bring it within calibration tolerances".
AN12.1.2	HEPA Filter Diff. Pressure Instr.	Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Estimated age of equipment is 15 years". "Low repair rate". "Calibration is on a annual rotation, performed in the field at 30 minutes per instrument". "No recurrent problems". "Tubing to the magnahelic gauges is run in a disorderly fashion and is not supported adequately".

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REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AN.12.1.3	Temperature Instrumentation	Inspect wiring where accessible. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Alarmed for loss of heaters or loss of fans".
AN.12.1.4	Heater Control Subsystem	Inspect wiring where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Estimated age of equipment is 15 years". "Frequent failures". "No calibration is performed. Functional test is performed by electricians at unknown intervals". "Thermostat failures are frequent and common".
AN.12.1.5	Fan/Motor Control Subsystem	Inspect wiring where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"MCC panels are not sealed correctly allowing dirt and moisture to accumulate inside the panels. Wiring is in adequate condition".
AN.12.1.6	Damper Control Subsystem	Inspect wiring where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Barber Coleman damper actuators and linkages are in disrepair on the K2-5-2 annulus system. Damper assemblies for the primary system are in adequate condition".
AN.12.1.8	Regulated Stack Monitoring System (296-A-27)		

REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AN.12.1.8.1	<i>Tubing from Stack to CAMs</i>	Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Tubing is in good condition and absent of corrosion".
AN.12.1.8.2	<i>CAMS (radiation analyzers)</i>	Inspect instrument cables where accessible. Inspect wiring where accessible. Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Estimated age of equipment is 15 years". "Low repair rate". "Calibration is on an annual rotation, performed in the shop at 4 hours per instrument". "The CAMS weigh in excess of 100 pounds and are hard to access for maintenance or repair".
AN.12.1.8.3	<i>CAM Cabinets</i>	Inspect equipment and cabinets/terminal boxes for corrosion. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"See comment at 2.1.8.2 about CAM access".
AN.12.1.8.4	<i>Vacuum Pumps</i>	Inspect wiring where accessible. Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Estimated age of equipment is 15 years". "No maintenance history was available (maintenance is performed by the millwrights)". "No calibration performed. Functional test only". "No known recurrent problems".
AN.12.1.8.5	<i>2-Pen Recorder (241-AN-271)</i>	Inspect wiring where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Wiring and tubing is in good condition". "Estimated age of equipment is 15 years". "Continual repair action required". "Calibration is on an annual rotation, performed in the field at 1 hour per instrument". "Manufactured by Speedomax. Three pin recorder with the exception of tank 107 which is a one pin recorder. Continual repair action is required and equipment often requires extensive repairs to bring it within calibration tolerances".
AN.12.2	TANK ANNULUS VENTILATION SYSTEM		

REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AN12.2.1	Annulus Diff. Pressure Inst. Subsystem	Inspect wiring where accessible. Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Local readout in the form is provided by the use of magnahelix gauges which are in adequate condition with the exception of poorly run and supported tubing. High and low pressure alarm pressure switches are located at the HEPA filter stations and remotely alarmed to the instrument building. Access could not be arranged to the switches at the time of the inspection".
AN13	TRANSFER LINE CONTROL SYSTEM		
AN13.1	PUMP CONTROL SUBSYSTEM		
AN13.2	VALVE POSITION INSTRUMENTATION/INDICATION		"Valve positions are located at the valve pit cover blocks and are manually read".
AN13.3	VALVE CONTROL SYSTEM		"Valve control is at the valve pit cover blocks and is manually set".
AN13.4	PRESSURE SWITCH INSTRUMENTATION (Flow Indication)	Inspect wiring where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Not accessed".
AN13.5	SERVICE PIT INSTRUMENT SUBSYSTEMS		
AN13.5.1	Flow Monitor & Totalizer	Inspect wiring where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	

REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AN13.5.2	Radiation (gamma) Monitor	Inspect instrument cables where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	
AN13.5.3	Pipeline Pressure Sensor	Inspect wiring where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	
AN14	TANK CONTENTS MONITORING SYSTEM		
AN14.1	TEMPERATURE/VAPOR INSTRUMENTATION		
AN14.1.1	Thermocouple Probes	Inspect instrument cables where accessible. Inspect wiring where accessible. Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the assessment".
AN14.1.2	Multifunction Instrument Tree	New equipment, no inspection required.	"Access could not be arranged at the time of the assessment".
AN14.1.3	Temperature Vapor Probe	New equipment, no inspection required.	"Access could not be arranged at the time of the assessment".
AN14.2	STANDARD HYDROGEN MONITORING SYSTEM	New equipment, no inspection required.	"There is three SHMS cabinets in operation in the AP farms that appear to be in good condition".
AN14.2.1	Gas Flow Instrumentation		
AN14.2.2	H ₂ Concentration, Low Range		
AN14.2.3	H ₂ Concentration, High Range		

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REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AN.14.2.4	Gas Temperature		
AN.14.2.5	3-Pen Recorder		"The pen recorders are manufactured by Yokogawa and are mounted in the SHMS cabinets located in the 24TAN farm. They appear to be in good condition."
AN.14.3	CHEMICAL COMPOSITION MONITORING INSTRUMENTATION		
AN.14.3.1	AN-107 Specific Gravity Instrumentation	Inspect instrument cables where accessible. Inspect wiring where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	
AN.14.4	TANK LIQUID SURFACE LEVEL INSTRUMENTATION		"Tank level instrumentation is currently a mixture of FIC and ENRAF. It appears they are in the process of upgrading the entire farm to ENRAF."
AN.14.4.1	FIC Riser Extension	Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment.	
AN.14.4.2	FIC Level Sensor	Inspect instrument cables where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"ENRAF model 854's have been installed on tanks 103,104,105, and 107. FIC's still remain on tanks 102, 101, and 106."
AN.14.4.4	FIC Buried Signal Cable	Inspect instrument cables where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Determine known continuous problems (operating or maintenance) with the equipment.	
AN.14.4.4	Terminal Boxes		

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REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AN.14.4.5	CASS Interface	Inspect instrument cables where accessible. Inspect wiring where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"TMACS is currently being installed and implemented in AN farm".
AN.14.5	SLUDGE WEIGHT (LEVEL) MONITORING	Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	
AN.15	TANK CONTENTS MIXING SYSTEMS		
AN.15.1	AIR LIFT CIRCULATOR CONTROL SYSTEM	Inspect wiring where accessible. Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	
AN.15.1.1	Diff. Pressure Sensors		
AN.15.1.2	Local Alarm Indication		
AN.15.2	MIXER PUMP CONTROL SYSTEM	Inspect instrument cables where accessible. Inspect wiring where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	
AN.15.2.1	Pump Sensors		

REF. NO.	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AN.I5.2.2	Pump Rotation Variable speed Drive Controller		
AN.I5.2.3	Pump (Impeller) Variable Speed Drive Controller		
AN.I5.2.4	Controller Interface		
AN.I5.2.5	Mixer Pump AN-107		
AN.I6	SCC STATUS/MONITORING SYSTEM		
AN.I6.1	AC POWER SUPPLY STATUS INST.		"Instrumentation power is in adequate condition".
AN.I6.2	AIR SUPPLY STATUS INST.		"Air lines are in adequate condition. Air quality is not monitored".
AN.I6.3	WATER SUPPLY STATUS INST.		
AN.I6.4	TANK CONCRETE STRUCTURE TEMPERATURE INST.	Inspect wiring where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Thermocouples have a history of failure".
AN.I6.4.1	Data Logger (See CASS Assessment)		
AN.I6.4.2	Manual Readout Control Panel		"Control panel is in adequate condition. The instruments that are used to measure the thermocouple readings are provided by the I&C tech taking the readings and were not accessed".
AN.I6.4.3	Signal Wiring/Terminal Boxes		"All TBXs and wiring that were accessed were in good condition".
AN.I6.5	HEAT TRACE SYSTEM STATUS INST.		
AN.I6.6	CATHODIC PROTECTION SYSTEM STATUS INST.		

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REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AN.17	HEAT TRACE CONTROL SYSTEM	Inspect wiring where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	
AN.17.1	TEMPERATURE MONITORING SENSORS		
AN.17.2	TEMP. CONTROLLER SUBSYSTEM		
AN.17.3	OVER TEMP. CONTROLLER SUBSYSTEM		
AN.17.4	HEATER CONTACTOR - OTHER WIRING		
AN.17.5	PIPELINE HEAT TRACE TAPE HEATER		
AN.18	CATHODIC PROTECTION CONTROL SYSTEM	Inspect wiring where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	
AN.18.1	POWER CONTROLLER		
AN.18.2	WIRING/CONDUIT/TBX		

3.7 CAIS Data Sheets

241 AN INSTRUMENT SYSTEMS NARRATIVE

EQUIPMENT DESCRIPTION

Instrumentation for the leak detection system is located in the tank annulus, leak detection pits, pump pits, process pits, and leak detector probes are also located in encasements throughout the process piping to detect piping leaks. The leak detector probes monitor for leaks originating at each of their respective locations.

Radiation monitoring instruments are located in the service pits, leak detector pits, at the tank annulus vents, and at the primary and annulus exhaust stacks.

Temperatures of the concrete foundation, the insulating concrete, and the sides of the primary tanks, can be read in the 241-AN-271 instrument building by using a selector switch to select the point to be read, and plugging in a temperature meter in the two pin socket provided on the instrument panel.

Tank level, tank pressure(high or low), and annulus level are monitored, and when abnormal conditions occur, will annunciate in the 241-AN-271 instrument building.

Ventilation instruments monitor and alarm during a loss of air flow from the annulus and primary tank, and a sensor located in the exhaust unit enclosure monitors and alarms on a high radiation condition. A loss of air flow or a high radiation condition will shut the exhaust unit down. By design, the back-up unit should start.

TMACS is presently capable of providing temperature readout. Three SHMS (standard hydrogen monitoring system) cabinets and four ENRAF stations are installed at this time. SHMS and ENRAFs will be tied into TMACS at the completion of their installation and acceptance test procedures.

SYSTEM CONDITION SUMMARY

241AN.11 LEAK CONTROL SYSTEM

WT-LEK-126 leak detector station alarms without any detectable reason, rendering it unreliable for detecting leaks. The gamma probe coaxial cable connection allows water infiltration which shorts out the probe frequently, causing damage to the pre-amplifier and amplifier instruments. The weight factor and specific gravity cabinets exhibit some minor dirt infiltration that appears to be caused from the cabinet latches not being properly fastened after maintenance is performed.

241AN.I1.2 ANNULUS LEAK INSTRUMENTATION

The CAMs for the vent pits and stack monitoring weigh in excess of 100 pounds and are difficult to access for maintenance and calibration. The pen recorders in the 271 instrument building appear to be in adequate condition although maintenance personnel report that they require frequent repair action. The annulus liquid presence sensors (flake boxes) exhibited some moisture/condensate buildup within the housing and require frequent replacement of the O-ring seals.

241AN.I2.1 TANK PRIMARY VENTILATION SYSTEM

The pressure recorders located in the 271 instrument building appear to be in adequate condition. Maintenance personnel report frequent repair actions are needed to maintain the recorders. The filter differential pressure gauges are in adequate condition, although the tubing runs to the gauges are not supported adequately. The blast heater controller failures are common. The inlet damper controller and linkages at the K2-5-2 annulus fan are in disrepair.

241AN.I4.4 TANK LIQUID SURFACE LEVEL INSTRUMENTATION

Four ENRAFs have been recently installed on tanks 103, 104, 105, and 107 farm with the intention of connecting these to the TMACS system. The remaining three tanks (101, 102, and 106) have FIC gauges. The FIC instruments require frequent maintenance and repair action.

SYSTEM RATING

The physical condition of the AN tank farm instrument system is rated as "adequate", 6

CONDITION ASSESSMENT INFORMATION SYSTEM

Report : RELATED SITE EQUIPMENT

Filename : RPTEQPT.lis

Run by : CAIS

Report Date : 29-NOV-95

^l&dParameters Entered^[&d@
Parent Equipment ID: %

CAIS Special Report - RPT-005

Asset	Site Component	Name	Sys No.	System Name
Survey Component				
Survey Comment				

241AN-0000 : UNDRGRND WASTE STOR TANK FARM

241AN WT-LEK-126 LEAK DET.PIT/SUMP INST. 1.1 LEAK DET. PIT/SUMP INST.

241AN WT-LEK-126 SUV LEAD DET PIT/SUMP INST 1.1 LEAK DET. PIT/SUMP INST.

Leak Detector station alarms without any detectable reason, unreliable for detecting leaks. Maintenance and troubleshooting should be performed to determine the cause of the false alarm and corrective action taken.

241AN PIT-241-AN-01 THRU 07C GAMMA PROBE WELL STRUCTURE 1.1.1.1 Gamma Probe Well Structure

Metal cover plate is not sealed and does leak water, however the majority of water accumulation is caused by condensation.

241AN RE-01 THRU 07C-1 GAMMA PROBE AND WELL CABLE 1.1.1.2 Gamma Probe & Well Cable

Cable is RG59 coaxial. Although the cable is sealed with RTV, I&C technicians indicate that cable failure at the connection is constant problem.

241AN CRM-OIC-1 THRU 7 CRM/ALARM COMPARATORS 1.1.1.5 Count Rate Meters/ Alarm comparators.

TBXs and wiring are in good condition; Low repair rate; No recurrent problems.

241AN PP LEK INST Pipeline Leak Detection Instr 1.3 PIPELINE LEAK INSTRUMENTATION

241AN ANN 101-106 Pipeline Leak Det Alarm Panel 1.5.1 Alarm Panel (241-AN-271)

Local alarm panels within the instrument buildings are in good condition, including the wiring, terminations, and tubing that could be assessed.

241AN LDA-241AN-01 thr 07 Pipeline Lek Det. TK Alarm Pnl 1.5.2 Tank Farm Alarm Panels

Local Alarm panels within the farms buildings are in adequate condition including the wiring terminations, and tubing that could be assessed

241AN DPIS SYS HEPA Filter Diff Press System 2.1.2 HEPA Filter Diff. Pressure In

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CONDITION ASSESSMENT INFORMATION SYSTEM

CAIS Special Report - RPT-005

Asset

Site Component	Name	Sys No.	System Name
Survey Component			
Survey Comment			

241AN-0000 : UNDRGRND WASTE STOR TANK FARM

241AN DPIS-1 THRU 6 HEPA FILTER DIFF PRESS INST 2.1.2 HEPA Filter Diff. Pressure Instr.

EST AGE OF EQUIP IS 15YRS. LOW REPAIR RATE. CALIBRATED ANNUALLY IN THE FIELD AT 30 MINUTES PER INST. NO RECURRENT PROBLEMS. TUBING TO THE MAGNAHELIX GAUGES IS RUN IN A DISORDERLY FASHION & IS NOT SUPPORTED ADEQUATELY.

241AN TS SYS Ventilation Temp. Inst sys 2.1.3 Temperature Instrumentation

241AN TS-3&4 TEMPERATURE INSTRUMENTATION 2.1.3 Temperature Instrumentation
ALARMED FOR LOSS OF HEATERS OR LOSS OF FANS.

241AN MCC-241-AN Motor Control Center 2.1.5 Fan-Motor Control Subsystem

241AN MCC-241-AN-SURVEY FAN MOTOR CONTROL 2.1.5 Fan-Motor Control Subsystem

MCC PANELS ARE NOT SEALED CORRECTLY WHICH ALLOWS DIRT AND MOISTURE TO ACCUMULATE INSIDE THE PANELS. WIRING IS IN ADEQUATE CONDITION.

241AN DPS sys	Damper Control System	2.1.6	Damper Control Subsystem
241AN DPS-1&4	DAMPER CONTROLLER SUBSYSTEM	2.1.6	Damper Control Subsystem
BARBER COLEMAN DAMPER ACTUATORS AND LINK AGES ARE IN DISREPAIR ON THE K2-5-2 ANNUALUS SYSTEM,BUT THEY CAN BE ADJUSTED MANUALLY. DAMPER ASSEMBLIES FOR THE PRIMARY SYSTEM ARE IN ADEQUATE CONDITION.			
241AN VP Inst sys	Valve Position Instr. Indicat	3.2	VALVE POSITION INSTRUMENTATION
241AN VPI	VALVE POSITION INDICATION	3.2	VALVE POSITION INSTRUMENTATION/ INDICATION
VALVE POSITIONS ARE LOCATED AT THE VALVE PIT COVER BLOCKS AND ARE READ MANUALLY.			

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CONDITION ASSESSMENT INFORMATION SYSTEM

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Asset	Site Component	Survey Component	Survey Comment	Name	Sys No.	System Name

241AN-0000	: UNDRGRND WASTE STOR TANK FARM					
241AN V CTRL				VALVE CONTROL SYSTEM	3.3	VALVE CONTROL SYSTEM
241AN VALVE CTRL				VALVE CONTROL	3.3	VALVE CONTROL SYSTEM
VALVE CONTROL IS AT THE VALVE PIT COVER BLOCKS AND IS MANUALLY SET.						
241AN VC sys				Valve Control Sys	3.3	VALVE CONTROL SYSTEM
241AN V CTRL				VALVE CONTROL SYSTEM	3.3	VALVE CONTROL SYSTEM
241AN SHMS sys				Standard Hydrogen Mon. Sys	4.2	STANDARD HYDROGEN MONITORING
241AN SHMS-1 THRU-3-CAB				SHMS CABINETS	4.2	STANDARD HYDROGEN MONITORING SYSTEM
THERE IS THREE SHMS CABINETS IN OPERATION IN THE AN FARM THAT APPEAR TO BE IN GOOD CONDITION.						
241AN SHMS-RR-1 THRU 3				3-PEN RECORDER	4.2.5	3-Pen Recorder

THE PEN RECORDERS ARE MANUFACTURED BY YO KOGAWA AND ARE MOUNTED IN THE SHMS CABINETS IN THE 241AN FARM. THEY APPEAR TO BE IN GOOD CONDITION.

241AN TK LL sys	Tk Liquid Level Inst. sys	4.4	TANK LIQUID SURFACE LEVEL INS
241AN TK-L-S-L	TK LIQUID SURFACE LEVEL	4.4	TANK LIQUID SURFACE LEVEL INSTRUMENTATI
TK LEVEL INSTRUMENTATION IS CURRENTLY A MIXTURE OF FIC AND ENRAF. IT APPEARS THE Y ARE IN THE PROCESS OF UPGRADING THE EN TIRE FARM TO ENRAF.			
241AN FIC-101 THRU 107	FIC LEVEL SENSOR	4.4.2	FIC Level Sensor
ENRAF MODEL 854'S HAVE BEEN INSTALLED ON TKS 103,104,105 & 107. FIC'S STILL REMA IN ON TKS 101,102 & 106			
241AN TBX'S	TERMINAL BOXES	4.4.4	Terminal Boxes
ALL TBX'S INSPECTED WERE IN GOOD CONDITI ON.			

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CONDITION ASSESSMENT INFORMATION SYSTEM

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Asset

Site Component

Survey Component

Survey Comment

Name

Sys No.

System Name

241AN-0000 : UNDRGRND WASTE STOR TANK FARM

241AN TK T SYS

TANK CONCREATE STRU TEMP INST 6.4 TANK CONCRETE STRUCTURE TEMPE

241AN TE-101 THRU 107
TEMPERATURE INS

TK CONC STRUCTURE TEMP INST 6.4 TANK CONCRETE STRUCTURE

THERMOCOUPLES HAVE A HISTORY OF FAILURE.

MANUAL READOUT CTRL PNL

MANUAL READOUT CONTROL PANEL 6.4.2 Manual Readout Control Panel

CONTROL PANEL IS IN ADEQUATE CONDITION.
THE INSTRUMENTS THAT MEASURES THE THERMO
COUPLE READINGS ARE PROVIDED BY THE MAIN
TENANCE I&C TECH. THE READINGS WERE NOT
ACCESSED.

241AN WIRING/CONDUIT

SIGNAL WIRING/TBX/CONDUIT 6.4.3 Signal Wiring/Terminal Boxes

ALL CONDUIT/WIRING/TBX'S THAT WERE ACCES
SED WERE IN GOOD CONDITION.

241AN ADP

ANNULUS DIFF PRESSURE INST .

241AN K2-DPI-1 THRU 24 & 29 ANNULUS DIFF PRESSURE INST 2.2.1 Annulus Diff. Pressure Inst. Subsystem

MAGNAHELIX GAUGES IN THE FARM ARE IN ADEQUATE CONDITION, THE TUBING RUN TO THESE ARE PROPERLY SUPPORTED. HIGH & LOW PRESSURE ALARMS/WITNESSES AT THE HEPA STATION ARE REMOTELY ALARMED AT 271 AN. ACCESS TO THE SWITCHES WAS NOT ARRANGED AT THE TIME OF THE INSPECTION.

241AN WF & SpG MON WF & SpG MONITORING SUBSYSTEM

241AN WFT-01 THRU 07C-1&2 WF PRESSURE SENSOR 1.1.2.2 Weight Factor & Specific Gravity Pressure

EST AGE OF EQUIP IS 15YRS WITH LOW REPAIR RATE. CALIBRATED ANNUALLY IN THE FIELD AT 1HR PER INST. NO RECURRENT PROBLEMS.

241AN SGT-01 THRU 07C-1 SpG PRESSURE SENSOR 1.1.2.2 Weight Factor & Specific Gravity Pressure

EST AGE OF EQUIP IS 15YRS WITH LOW REPAIR RATE. CALIBRATED ANNUALLY IN THE FIELD AT 1HR PER INST. NO RECURRENT PROBLEMS.

241AN 241-AN-01 THRU 07C-CAB WF CABINET (XMITTER ENCLOSURE) 1.1.2.3 Weight Factor Cabinet (Xmitter Enclosure)

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CONDITION ASSESSMENT INFORMATION SYSTEM

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Asset	Site Component	Name	Sys No.	System Name
Survey Component	Survey Comment			

241AN-0000 : UNDRGRND WASTE STOR TANK FARM

241AN FIELD TUBING FIELD TUBING 1.1.2.4 Field Tubing

241AN ANN PPLPS ANNULUS PUMP PIT PRESEN SENSOR .

241AN LDE-241AN-01 THRU 07B ANN PUMP PIT PRESENCE SENSOR 1.2.3 ANNULUS PUMP PIT L PRESENCE SE

Low repair rate; No calibration, functional test only; Terminal boxes exhibited a presence of condensation at some of the Flake boxes. O-ring seals are frequently replaced. Purge air is used at each Flake box.

241AN ANNUL LPS ANNULUS LIQUID PRESENCE SENSOR .

241AN LDI-101 THRU 107- 2,3&4 ANN LIQUID PRESENCE SENSORS 1.2.2 Annulus Liquid Presence Sensor

Low repair rate; No calibration performed, functional test monthly; Terminal boxes

s exhibited a presence of condensation at some of the Flake boxes. O-ring seals are frequently replaced. Purge air is used at each Flake box.

241AN HTR CTRL HEATER CONTROLLER SUBSYSTEM

241AN TS-1&2 HEATER CONTROLLER 2.1.4 Heater Control Subsystem

EST AGE OF EQUIP IS 15YRS. FREQUENT FAILURES. NO CALIBRATION IS PERFORMED. FUNCTION TEST IS PERFORMED BY ELECTRICIANS AT UNKNOWN INTERVALS. THERMOSTAT FAILURES ARE FREQUENT AND COMMON.

241AN CASS CASS ITERFACE

241AN CASS INTERFACE CASS INTERFACE 4.4.5 CASS Interface

TMACS IS CURRENTLY BEING INSTALLED AND IMPLEMENTED IN AN FARM.

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CONDITION ASSESSMENT INFORMATION SYSTEM

CAIS Special Report - RPT-005

Asset	Site Component	Name	Sys No.	System Name
	Survey Component			
	Survey Comment			

241AN271-0000 : INSTRUMENT CONTROL HOUSE				
241AN TK DP SYS		Tank Diff Pressure Sys	2.1.1	Tank Diff. Pressure Inst. Sub
241AN PI-101 THRU 107-1		PRESSURE SENSOR XMITTER	2.1.1.2	Pressure Sensor/Transmitter
EST AGE OF EQUIP IS 15YRS. CONTINUAL REPAIR ACTION IS REQUIRED. CALIBRATED ANNUALLY IN THE FIELD AT 1HR PER INST. FREQUENT FAILURE OF THE CONTACTS IN THE RELAY AND FAILURE OF THE PHOTO CELL.				
241AN PAS-101 THRU 107-1&2		PRESSURE SWITCH/ALARM	2.1.1.4	Pressure Switch/Alarm
WIRING AND TUBING IS IN GOOD CONDITION. EST AGE OF EQUIP IS 15YRS. LOW REPAIR RATE. CALIBRATED ANNUALLY IN THE FIELD AT 1HR PER INSTR. NO RECURRENT PROBLEMS.				
241AN-271 PR-101 THRU 107-1&2		PRESSURE RECORDER	2.1.1.5	Pressure Recorder (241-AN-271)
WIRING & TUBING IS IN GOOD CONDITION. EST AGE OF EQUIP IS 15YRS. CONTINUAL EXTENSIVE REPAIR ACTION REQUIRED TO BRING INSTRUMENT INTO CALIBRATION TOLERANCES. CALIBRATED ANNUALLY IN THE FIELD AT 1HR PER				

INSTRUMENT.

241AN 296-A-27 sys	Regulated Stack Monitoring	2.1.8	Regulated Stack Monitoring Sy
214AN K1 & K2-VP-1&2	VACUUM PUMPS	1..8.4	VACUUM PUMPS
EST AGE OF EQUIP IS 15YRS. MILLWRIGHTS PERFORM THE MAINTENANCE, THERE IS NO MAINTENANCE HISTORY AVAILABLE. FUNCTIONALLY TESTED ONLY. NO KNOWN RECURRENT PROBLEMS			
241AN TUBING	TUBING FROM STACK TO CAM	2.1.8.1	Tubing from Stack to CAMs
TUBING IS IN GOOD CONDITION AND ABSENT OF CORROSION.			
241AN FI-CAM-K1 & K2	CAM RAD ANALYZER	2.1.8.2	CAMS (radiation analyzers)
EST AGE OF EQUIP IS 15YRS WITH LOW REPAIR RATE. CALIBRATED ANNUALLY IN THE SHOP AT 4HRS PER INST. THE CAM WEIGH IN EXCESS OF 100 POUNDS AND ARE HARD TO ACCESS FOR MAINTENANCE OR REPAIR.			

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CONDITION ASSESSMENT INFORMATION SYSTEM

Page 7 of 8

CAIS Special Report - RPT-005

Asset

Site Component

Survey Component

Survey Comment

Name

Sys No.

System Name

241AN271-0000 : INSTRUMENT CONTROL HOUSE

241AN RAN-EXH-K1 & K2-CAB

CAM CABINETS

2.1.8.3 CAM Cabinets

THE CAM CABINETS ARE POORLY DESIGNED FOR
MAINTENANCE AND REPAIR/REPLACEMENT OF T
HE 100 POUND PLUS CAMS.

241AN-271 RR-EXH-K1 & K2

PEN RECORDER

2.1.8.5 ?-Pen Recorder (241-AN-271)

MANUFACTURED BY SPEEDOMAX THE 3-PEN RECO
RDER NEEDS CONTINUAL EXTENSIVE REPAIR TO
BRING EQUIP WITHIN CALIBRATION TOLERANC
ES. EST AGE OF EQUIP IS 15YRS. WIRING AN
D TUBING IS IN GOOD CONDITION. CALIBRATE
D ANNUALLY IN THE FIELD AT 1HR PER INSTR
UMENT.

241AN-271 PWR SUPPLY SYS

AC POWER SUPPLY STATUS INST

6.1

AC POWER SUPPLY STATUS INST.

241AN-271 AC PWR STAT

AC POWER SUPPLY STATUS

6.1

AC POWER SUPPLY STATUS INST.

INSTRUMENTATION POWER IS IN ADEQUATE CON
DITION.

241AN-271 CA INST SYS	COMP AIR SUPPLY INST SYS	6.2	AIR SUPPLY STATUS INST.
241AN-271 AIR STATUS	AIR SUPPLY STATUS	6.2	AIR SUPPLY STATUS INST.
AIR LINES ARE IN ADEQUATE CONDITION. AIR QUALITY IS NOT MONITORED			
241AN ANN CAM RM	ANNULUS CAM RAD MONITORING SYS		
241AN EXH-K2-PROBE	AIR SAMPLER PROBE/TUBING/ECT.	1.2.1.1	Air Sampler Probe/ Tubing/ etc
Probe could not be accessed at this time . Tubing has no signs of corrosion or damage.			
241AN FI-CAM-101 THRU 107	RADIATION ANALYZER	1.2.1.2	Radiation Analyzer
Low repair rate; Calibration annually; The CAMS weigh in excess of 100 pounds and are hard to access for maintenance of repair.			

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CONDITION ASSESSMENT INFORMATION SYSTEM

Page 8 of 8

CAIS Special Report - RPT-005

Asset	Site Component	Name	Sys No.	System Name
Survey Component	Survey Comment			

241AN271-0000 : INSTRUMENT CONTROL HOUSE

241AN RAN-EXH -101-107 CAB Annulus Leak Det Inst Cabinet 1.2.1.3 Cabinet (Vent. Pit)

Cabinets are in adequate condition. Door latches are often not sealed properly after maintenance is performed.

241AN RAN-EXH-101 THRU 107-CAB CABINETS (VENT PIT) 1.2.1.3 Cabinet (Vent. Pit)

Cabinet doors do not seal properly and/or access latches are not properly closed after maintenance is performed allowing dirt to infiltrate the cabinet.

241AN-271 RR-EXH-101 THRU 106 3 PEN RECORDERS & ALARMS 1.2.1.4 3-Pen recorder & Alarms (241-AN-271)

CABLE & WIRING ARE IN GOOD CONDITION. ESTAGE OF EQUIP IS 15YRS. CAL. ON ANNUAL ROTATION IN THE FIELD AT 1HR PER INSTR. CONTINUAL EXTENSIVE REPAIR ACTION REQUIRED TO BRING EQUIP INTO CALIBRATION TOLERANCES.

241AN-271 RR-EXH-107 1-PEN RECORDER & ALARM 1.2.1.4 3-Pen recorder & Alarms (241-AN-271)

CABLE AND WIRING ARE IN GOOD CONDITION.

EST AGE OF EQUIP IS 15YRS. CALIBRATION I
S ON AN ANNUAL ROTATION IN THE FIELD AT
ONE HR PER INSTR. CONTINUAL, EXTENSIVE R
EPAIR ACTION IS REQUIRED TO BRING EQUIP
INTO CALIBRATION TOLERANCES.

241AN-271 MPS SYS

MPS RELAY PANEL

241AN-271 MPS RELAY PANEL SUR MPS RELAY PANEL

1.4.1

241-AN-271 Master Pump Shutdown Relay P

WIRING IS IN GOOD CONDITION WITHIN RELAY
PANEL INSIDE 271 BLDG. EST AGE OF EQUIP
IS 15YRS. MAINTENANCE HISTORY COULD NOT
BE OBTAINED AT THIS TIME. NO KNOWN RECU
RRENT PROBLEMS.

241AN MPSRP S Wire

MPSRP Signal Wiring/Cond/TBX

1.4.1

241-AN-271 Master Pump Shutdown Relay Panel

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3.8 Other Reports

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3.9 CAMP Work Sheets

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WHC-SD-W314-ES-018, Rev 0

CAMP RATING FORM

Project Title: AN T.F.: Leak Control System: Leak Det. Pit: Gamma Rad. Mon. Subsystem

B&R Code: _____ Rev #: 0 FY: 1996

Project Id #: AN.II.1.1 FUDS: _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.		30		30
Technological Base (R&D)		30		30
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics				
Criticality				
Infrastructure				40
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				30
Mission Capability, Capacity, & Quality				40
Asset Condition				55
National Business Strategies/Partnerships				
Highest of Each Subcategory	20	30	20	55

PROJECT RATING: 56

Final Project Rating 56

Note: 20 is a Default Rating

C.D. Acree	376-1901	9/29/95
Rated By	Ext	Date Rated

Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

ER/WM, Compliance, 30: Minimum detection capability lacking
M&I, Asset Condition, 55: Aging System, Spare Parts availability concern.
M&I, Infrastructure, 40: Substandard Operation
M&I, Mission Capability, 40: System not designed to operate in a wet environment.

Additional Information & Affected Projects

Shaded Areas Are Not For Use

WHC-SD-W314-ES-018, Rev 0

CAMP RATING FORM

Project Title: AN Tank Farm/Leak Control System/Leak Detection System/Pit WF&SpG Monitor

B&R Code: _____ **Rev #:** 0 **FY:** 1996

Project Id #: AN.I1.1.2 **FUDS:** _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.				
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics				
Criticality				
Infrastructure				
Liquid and Hazardous Waste				40
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				50
Asset Condition				50
National Business Strategies/Partnerships				
Highest of Each Subcategory	20	20	20	50

PROJECT RATING:	50
Final Project Rating	50

Note: 20 is a Default Rating

<u>C. D. Acree</u>		<u>9/29/95</u>
Rated By	Ext	Date Rated

Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

M&I, Asset Cond., 50: Foxboro equipment is obsolete, spare parts may not be available in future.
M&I, Capability, 50: Does not measure liquid level directly, uses pressure
M&I, Infrastructure, 40: system is continuous user of instrument air.

Additional Information & Affected Projects

Shaded Areas Are Not For Use

WHC-SDD-W314-ES-018, Rev 0

CAMP RATING FORM

Project Title: AN Tank Farm Annulus Leak Instrumentation/ CAM Rad. monitoring System

B&R Code: _____ Rev #: 0 FY: 1996

Project Id #: AN.11.2.1 FUDS: _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.				
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety	35			
Fire Protection				
Health Physics	40			
Criticality				
Infrastructure				40
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				40
Asset Condition				35
National Business Strategies/Partnerships				
Highest of Each Subcategory	40	20	20	40

PROJECT RATING:	43
Final Project Rating	43

Note: 20 is a Default Rating

C. D. Acree		9/29/95
Rated By	Ext	Date Rated

Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

H&S, Health Physics, 40: Potential for personnel radiation exposure.
H&S, Industrial Safety, 35: Potential for personnel injury lifting CAM unit (100lbs)

Additional Information & Affected Projects

M&I, Asset Condition, 35: Aging System, subject to false alarms
M&I, Mission Capability, 40: Aging system, not latest recommend site standard, false alarms, radon interf
M&I, Infrastructure, 40: Aging System, subject to false alarms & difficult to lift/maintain

Shaded Areas Are Not For Use

WHC-SD-W314-ES-018, Rev 0

CAMP RATING FORM

Project Title: 244-A DCRT Annulus Leak Inst./Wt Ft & SpG Monitoring Subsystem

B&R Code: _____ Rev #: 0 FY: 1996

Project Id #: DA.I1.2.2 FUDS: _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.		40		
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics				
Criticality				
Infrastructure				40
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				50
Asset Condition				50
National Business Strategies/Partnerships				
Highest of Each Subcategory	20	40	20	50

PROJECT RATING:	52
Final Project Rating	52

Note: 20 is a Default Rating

C. D. Acree		9/29/95
Rated By	Ext	Date Rated

Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

M&I, Asset Condition, 50: Equipment is obsolete, maintenance problems, future spare parts problem.
M&I, Mission Capability, 50: Not a good leak detect. inst., requires water in the annulus.
ER/WM, Compliance, 40: Leak sensitivity not determinate, calibration difficulties, is a misapplication of leak detection equipment.

Additional Information & Affected Projects

M&I, Infrastructure, 40: Continuous user of instrument air. Water in annulus may interfere with the annulus CAM radiation monitoring system.

Shaded Areas Are Not For Use

WHC-SD-W314-ES-018, Rev 0

CAMP RATING FORM

Project Title: AN Tank Farm/Pipeline Leak Inst./PitLiquid Leak Detect. Sub. Sys./COB, Transfer

B&R Code: _____ **Rev #:** 0 **FY:** 1996

Project Id #: AN.I1.3.1, AN.I1.3.3, AN.I1.1.3, AN.I1.2.3 **FUDS:** _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.		50		
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety	35			
Fire Protection				
Health Physics	50			
Criticality				
Infrastructure				50
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				50
Asset Condition				55
National Business Strategies/Partnerships				
Highest of Each Subcategory	50	50	20	55

PROJECT RATING:	60
Final Project Rating	60

Note: 20 is a Default Rating

Rated By	<u>C. D. Acree</u>	Ext	<u>9/29/95</u>
			Date Rated

Reviewed By		Ext	
			Date Reviewed

Applicable Regulations or Policies

H&S, Health Physics, 50: Potential for maintenance personnel radiation exposure.
H&S, Industrial Safety, 35: Potential for personnel radiation exposure.
ER/WM, Compliance, 50: Cannot detect small leaks or detect secondary containment failure.

Additional Information & Affected Projects

M&I, Asset Condition, 55: Aging System, subject to false alarms.
M&I, Mission Capability, 50: System cannot detect small leaks, cannot detect secondary containment failure, cannot be calibrated, cannot verify system operability.
M&I, Infrastructure, 50: Wiring life expectancy is short.

Shaded Areas Are Not For Use

WHC-SD-W314-ES-018, Rev 0

CAMP RATING FORM

Project Title: AN Tank Farm/Pipeline Leak Inst./Pipeline Annulus Pressure Sensor

B&R Code: _____ **Rev #:** 0 **FY:** 1996

Project Id #: AN.I1.3.2 **FUDS:** _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.		50		
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety	35			
Fire Protection				
Health Physics	50			
Criticality				
Infrastructure				40
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				50
Asset Condition				
National Business Strategies/Partnerships				
Highest of Each Subcategory	50	50	20	50

PROJECT RATING:	56
Final Project Rating	56

Note: 20 is a Default Rating

<u>C. D. Acree</u>		<u>9/29/95</u>
Rated By	Ext	Date Rated

Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

ER/WM, Compliance, 50: Pipelines do not have Inst. that can detect pl secondary containment failure.
M&I, Mission Capability, 50: System sensitivity is unknown, it cannot be calibrated, is difficult to verify operability, not available on all pipelines.

Additional Information & Affected Projects

H&S, Health Physics, 50: Potential for maintenance personnel radiation exposure.

M&I, Infrastructure, 40: System is continual user of instrument air.

(See AN.I1.3.1)

Shaded Areas Are Not For Use

WHC-SD-W134-ES-018, Rev 0

CAMP RATING FORM

Project Title: AN Tank Farm Pump Permissive (Master Pump Shutdown)

B&R Code: _____ **Rev #:** 0 **FY:** 1996

Project Id #: AN.I1.4 **FUDS:** _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.				
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics				
Criticality				
Infrastructure				45
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				55
Asset Condition				55
National Business Strategies/Partnerships				
Highest of Each Subcategory	20	20	20	55

PROJECT RATING:	55
Final Project Rating	55

Note: 20 is a Default Rating

C. D. Acree		9/29/95
Rated By	Ext	Date Rated

Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

M&I, Mission Capability, 55: Mission adversely impacted by false alarms, any alarm in all tank farms can shut down a transfer, even in farms that are unrelated.

M&I, Asset Condition, 55: Same as Leak Detection System (wiring), re: AN.I1.3.1

M&I, Infrastructure, 45: Spurious shutdowns cause delays and idle lots of people.

Additional Information & Affected Projects

M&I, Mission Capability, 55: System provide no operational versatility. Cannot easily make simultaneous transfers. Cannot easily isolate operations in different facilities.

Shaded Areas Are Not For Use

WHC-SD-W314-ES-018, Rev 0

CAMP RATING FORM

Project Title: AN Tank Farm Remote Alarm Signaling System (Gamewell Loop Sys.)

B&R Code: _____ **Rev #:** 0 **FY:** 1996

Project Id #: AN.I1.6 **FUDS:** _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.				
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics				
Criticality				
Infrastructure				40
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				35
Asset Condition				50
National Business Strategies/Partnerships				
Highest of Each Subcategory	20	20	20	50

PROJECT RATING:	50
Final Project Rating	50

Note: 20 is a Default Rating

<u>C. D. Acree</u>		<u>9/29/95</u>
Rated By	Ext	Date Rated

Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

M&I, Infrastructure, 40: Poor interface design, not standard hardware, spare parts problem
M&I, Mission Capability, 35: System does not provide unique alarm identification, and is unreliable.

M&I, Asset Condition, 50: System in poor condition, maintenance intensive, mostly doesn't work.

Additional Information & Affected Projects

Shaded Areas Are Not For Use

WHC-SD-W314-ES-018, Rev 0

CAMP RATING FORM

Project Title: AN Tank Farm Tank Waste High Level Alarm Subsystem

B&R Code: _____ Rev #: 0 FY: 1996

Project Id #: AN.I1.7 FUDS: _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.				
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics	45			
Criticality				
Infrastructure				40
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				55
Asset Condition				55
National Business Strategies/Partnerships				
Highest of Each Subcategory	45	20	20	55

PROJECT RATING:	57
Final Project Rating	57

Note: 20 is a Default Rating

C. D. Acree		9/29/95
Rated By	Ext	Date Rated

Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

M&I, Asset Condition, 55: Aging system, equipment is similar to Leak Detection System.
M&I, Mission Capability, 55: Cannot calibrate probe, cannot verify probe is functional.
System is not intrinsically safe, not suitable for hazardous gas environment.

Additional Information & Affected Projects

H&S, Health Physics, 45: Probe maintenance will expose workers to radiation.
M&I, Infrastructure, 40: Maintenance of probe is difficult.

Shaded Areas Are Not For Use

WHC-SD-W314-ES-018, Rev 0
CAMP RATING FORM

Project Title: AN DST DIFFERENTIAL PRESSURE INSTR. SUBSYSTEM

B&R Code: _____ Rev #: 0 FY: 1996

Project Id #: AN.I2.1.1 FUDS: _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.				
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics				
Criticality				
Infrastructure				40
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				50
Asset Condition				40
National Business Strategies/Partnerships				
Highest of Each Subcategory	20	20	20	50

PROJECT RATING:	50
Final Project Rating	50

Note: 20 is a Default Rating

C. D. Acree		9/22/95
Rated By	Ext	Date Rated

Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

M&I, Asset Condition, 40: Equipment is obsolete (50 yr old design), spare parts availability concern.
M&I, Capability, 50: Recorders are significant maintenance effort. Pressure data is not automatically sent to electronic database.

Additional Information & Affected Projects

M&I, Asset Condition, 40: Some tubing deterioration concerns.
M&I, Infrastructure, 40: Continuous user of instrument air.

WHC-SD-W314-ES-018, Rev 0 **CAMP RATING FORM**

Project Title: AN Tank Farm/Primary Ventilation/Regulated Stack Monitoring System

B&R Code: _____ **Rev #:** 0 **FY:** 1996

Project Id #: AN.I2.1.8 **FUDS:** _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.		55		
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics	45			
Criticality				
Infrastructure				40
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				55
Asset Condition				45
National Business Strategies/Partnerships				
Highest of Each Subcategory	45	55	20	55

PROJECT RATING:	60
Final Project Rating	60

Note: 20 is a Default Rating

<u>C. D. Acree</u>		<u>9/29/95</u>
Rated By	Ext	Date Rated

Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

ER/WM, Compliance, 55: System is not compliant with regulatory requirements.
M&I, Mission Capability, 55: System can not detect at required limits, systems does not detect other required gaseous emmissions. Not latest recommended site standard CAM

Additional Information & Affected Projects

M&I, Asset condition, 45: Aging system, difficult to lift/maintain.
H&S, Health Physics, 45: Potential radiation exposure to maintenance personnel.
M&I, Infrastructure, 40: Aging system, difficult to status HVAC system.

WHC-SD-W314-ES-018, Rev 0

CAMP RATING FORM

Project Title: AN Tank Farm/Waste Flow Monitoring Inst./Service Pit Inst.

B&R Code: _____ Rev #: 0 FY: 1996

Project Id #: AN.I3.5.1 FUDS: _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.				
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics				
Criticality				
Infrastructure				
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				45
Asset Condition				40
National Business Strategies/Partnerships				
Highest of Each Subcategory	20	20	20	45

PROJECT RATING:	45
Final Project Rating	45

Note: 20 is a Default Rating

C. D. Acree		9/29/95
Rated By	Ext	Date Rated
Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

M&I, Capability, 45: Flow meters cannot measure low flows.
M&I, Asset Condition, 40: Aging System

Additional Information & Affected Projects

WHC-SD-W314-ES-018, Rev 0

CAMP RATING FORM

Project Title: AN DST WASTE; THERMOCOUPLE TREES

B&R Code: _____ Rev #: _____ FY: _____

Project Id #: AN.I4.1 FUDS: _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.				
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics	40			
Criticality				
Infrastructure				40
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				40
Asset Condition				35
National Business Strategies/Partnerships				
Highest of Each Subcategory	40	20	20	40

PROJECT RATING: **43**
Final Project Rating **43**

Note: 20 is a Default Rating

C. D. Acree		9/29/95
Rated By	Ext	Date Rated

Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

M&I, Capability, 40: Elements can not be calibrated. Elements spaced at 2 ft intervals limit capability.
Note: Probe may not withstand mixer pump forces.
H&S, Health Physics, 40: Probe maintenance will expose workers to radiation.

Additional Information & Affected Projects

M&I, Infrastructure, 40: Elements are not replaceable, probe is not maintainable.
M&I, Asset Condition, 35: Equipment is old, but functional

Shaded Areas Are Not For Use

WHC-SD-W314-ES-018, Rev 0

Project Title: AN DST WASTE; FIC LIQUID SURFACE LEVEL INST. SUBSYSTEM

B&R Code: _____ Rev #: _____ FY: _____

Project Id #: AN.I4.4 _____ FUDS: _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.				
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics	35			
Criticality				
Infrastructure				50
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				60
Asset Condition				60
National Business Strategies/Partnerships				
Highest of Each Subcategory	35	20	20	60

PROJECT RATING:	61
Final Project Rating	61

Note: 20 is a Default Rating

C. D. Acree		9/29/95
Rated By	Ext	Date Rated

Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

M&I, Asset Condition, 60: FIC gauges are inoperative. Extensive maintenance is normally required.
M&I, Capability, 60: FIC Gauges have poor resolution.
M&I, Infrastructure, 50: Poor resolution of FIC gauges exacerbates mass balance computation
for checking waste transfer operations.

Additional Information & Affected Projects

H&S, Health Physics, 35: Maintenance of the FIC may expose workers to radiation.
M&I, Infrastructure, 50: Future spare parts problem.

Shaded Areas Are Not For Use

WHC-SD-W314-ES-018, Rev 0

CAMP RATING FORM

Project Title: AN Tank Farm/Pipeline Heat Trace I&C Subsystem

B&R Code: _____ **Rev #:** 0 **FY:** 1996

Project Id #: AN.17 **FUDS:** _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.				
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics				
Criticality				
Infrastructure				40
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				40
Asset Condition				50
National Business Strategies/Partnerships				
Highest of Each Subcategory	20	20	20	50

PROJECT RATING:	50
Final Project Rating	50

Note: 20 is a Default Rating

<u>C. D. Acree</u>		<u>9/29/95</u>
Rated By	Ext	Date Rated

Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

M&I, Asset Condition, 50: Some Pipelines have broken heat trace heaters.
M&I, Capability, 40:
M&I, Infrastructure, 40: Lack of pipe heating may affect transfer capability on some pipelines.

Additional Information & Affected Projects

Shaded Areas Are Not For Use

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4.0 AP TANK FARM

4.1 PDRD Cross Reference Tables

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PROJECT W-314
PDRD CROSS REFERENCED TABLE
INSTRUMENT & CONTROL SYSTEMS

PDRD FUNCTION ID#	PDRD FUNCTION VERB	PDRD DATA VARIABLE	EQUIPMENT REFERENCE TREE	COMMENTS
3.2.1.1.1.1	Monitor	Hydroxide conc. Nitrate concentration Nitrite concentration Sodium concentration Specific Gravity	Non-existent architecture Non-existent architecture Non-existent architecture Non-existent architecture Non-existent architecture	Manual Sampling, Lab. Analysis function
3.2.1.1.1.1.2	Compare	Hydroxide conc. Nitrate concentration Nitrite concentration	Non-existent architecture Non-existent architecture	Lab. Analysis function
3.2.1.1.1.2.1.2	Compare	Specific Gravity	Non-existent architecture	Administrative function,
3.2.1.1.1.2.1.3	Compare	Sodium concentration	Non-existent architecture	Lab. Analysis function
3.2.1.1.1.2.1.4	Compare	Pu concentration	Non-existent architecture	Lab. Analysis function
3.2.1.1.1.3	Alarm	Waste composition	Non-existent architecture	Administrative function
3.2.1.1.1.4	Control	Waste composition	Non-existent architecture	Administrative function
3.2.1.1.1.5	Monitor	Supernate Liquid Level	AP.14.4.2	Old FIC gauges should be replaced with Enraf gauges
			AP.11.7	Old high level probes, field wiring and relays require replacement.
3.2.1.1.1.6	Compare	Supernate Liquid Level	Not Assessed	Old CASS computer function, TMACS will replace
			AP.11.4	Old relays work in Master Pump Shutdown (re: AP.11.4)
3.2.1.1.1.7	Alarm	Supernate Liquid Level	Not Assessed	Old CASS computer function, TMACS will replace.
			AP.11.5	Local Alarm function (re: AP.11.5)
3.2.1.1.1.8	Control	Supernate Liquid Level	Non-existent architecture	Administrative function
3.2.1.1.1.9	Monitor	Waste Temperature	AP.14.1	Old CASS/Manual Operation, TMACS will replace.

PROJECT W-314 PDRD CROSS REFERENCED TABLE INSTRUMENT & CONTROL SYSTEMS				
PDRD FUNCTION ID#	PDRD FUNCTION VERB	PDRD DATA VARIABLE	EQUIPMENT REFERENCE TREE	COMMENTS
3.2.1.1.1.10	Compare	Waste Temperature	Not Assessed	Old CASS Operation, TMACS will replace.
3.2.1.1.1.11	Alarm	Waste Temperature	Not Assessed	Old Output Report from CASS, TMACS will replace.
3.2.1.1.1.12 3.2.1.2.1.1	Control	Waste Temperature (indirectly) Ventilation System Airflow	Not Assessed re: AP.12.1.5 See HVAC assessment.	Administrative function Manual adjustment required
3.2.1.1.1.13	Monitor	Waste Level	AP.14.4.2	
3.2.1.1.1.14	Compare	Waste Level	Not Assessed	See 3.2.1.1.1.6
3.2.1.1.1.15	Alarm	Waste Level	Not Assessed No automatic control architecture.	See 3.2.1.1.1.7
3.2.1.1.1.16	Control	Waste Level	Not Assessed	Administrative function
3.2.1.1.1.17(1)	Monitor	Leak Det. Pit Radiation Level	AP.11.1.1	
3.2.1.1.1.17(1)	Monitor	Leak Det. Pit Temperature	AP.17.1.4, Not Assessed	Trade Study should reassess the need for this instrument. Suggest deletion and revised PDRD.
3.2.1.1.1.17(1)	Monitor	Leak Det. Pit Waste Level	AP.11.1.2	
3.2.1.1.1.17(2)	Monitor	Tank Annulus Radiation Level	AP.11.2.1	
3.2.1.1.1.17(2)	Monitor	Tank Annulus Liquid Presence/Level	AP.17.2.2	
3.2.1.1.1.18	Compare	Leak Det. Pit Radiation Level	AP.11.1.1.5	
3.2.1.1.1.18	Compare	Leak Det. Pit Temperature	Not Assessed	Trade Study should reassess the need for this instrument. Suggest deletion and revised PDRD.
3.2.1.1.1.18	Compare	Leak Det. Pit Water Level	AP.11.1.2.5	

PROJECT W-314 PDRD CROSS REFERENCED TABLE INSTRUMENT & CONTROL SYSTEMS				
PDRD FUNCTION ID#	PDRD FUNCTION VERB	PDRD DATA VARIABLE	EQUIPMENT REFERENCE TREE	COMMENTS
3.2.1.1.1.18	Compare	Tank Annulus Radiation Level	AP.11.2.1.4	
3.2.1.1.1.18	Compare	Tank Annulus Liquid Presence/Level	AP.11.2.2	
3.2.1.1.1.19	Alarm	Leakage From Tank Bottom	AP.11.2.1.4	
3.2.1.1.1.19	Alarm	Leakage From Tank Annulus	AP.11.1.2.5 AP.11.1.1.5	
3.2.1.1.1.20	Control	Leakage From Tank Bottom	Not Assessed re: AP.13.1 & L.D.P Pump	Administrative function
3.2.1.1.1.20	Control	Leakage From Tank Annulus	Not Assessed	Administrative function
3.2.1.1.1.21	Monitor	Leak Det. Pit Liquid Level	See 3.2.1.1.1.17(1)	
3.2.1.1.1.22	Compare	Leak Det. Pit Liquid Level	See 3.2.1.1.1.18	
3.2.1.1.1.23	Alarm	Leak Det. Pit Liquid Level	See 3.2.1.1.1	
3.2.1.1.1.24	Control	Leak Det. Pit Liquid Level	AP.11.1.2.5	
3.2.1.1.1.25	Monitor	Tank Vapor Space Temperature Gradient	AP.14.1	Old Data Loggers. Old manual operation.
3.2.1.1.1.26	Compare	Tank Vapor Space Temperature Gradient	Not Assessed	Old CASS operation.
3.2.1.1.1.27	Alarm	Tank Vapor Space Temperature Gradient	Not Assessed	Old CASS operation.

PROJECT W-314 PDRD CROSS REFERENCED TABLE INSTRUMENT & CONTROL SYSTEMS				
PDRD FUNCTION ID#	PDRD FUNCTION VERB	PDRD DATA VARIABLE	EQUIPMENT REFERENCE TREE	COMMENTS
3.2.1.1.1.28	Control	Tank Vapor Space Temperature Gradient	Not Assessed re: AP.12.1.5	Administrative function.
3.2.1.1.1.29	Monitor	Tank [Concrete] Structure Temperature	AP.16.4	Old Data Logger connects to CASS.
3.2.1.1.1.30	Compare	Tank [Concrete] Structure Temperature	Not Assessed	Old CASS operation
3.2.1.1.1.31	Alarm	Tank [Concrete] Structure Temperature	Not Assessed	Old CASS operation
3.2.1.1.1.32 3.2.1.2.1.1.2	Control	Tank [Concrete] Structure Temperature (indirectly) Ventilation System Airflow	Not Assessed re: AP.12.1.5	Administrative function
3.2.1.1.1.33	Monitor	Tank Vapor Space Pressure	AP.12.1.1.2 AP.12.1.1.5	
3.2.1.1.1.34	Compare	Tank Vapor Space Pressure	AP.12.1.1.4	
3.2.1.1.1.35	Alarm	Tank Vapor Space Pressure	AP.12.1.1.4	
3.2.1.1.1.36	Control	Tank Vapor Space Pressure	Not Assessed re: AP.12.1.5 & AP.12.1.6	Administrative function.
3.2.1.1.1.37	Monitor	Tank Flammable Gas Concentration	AP.14.2, Not Assessed	New System (SHMS)
3.2.1.1.1.38	Compare	Tank Flammable Gas Concentration	AP.14.2, Not Assessed	New System (SHMS)

PROJECT W-314 PDRD CROSS REFERENCED TABLE INSTRUMENT & CONTROL SYSTEMS				
PDRD FUNCTION ID#	PDRD FUNCTION VERB	PDRD DATA VARIABLE	EQUIPMENT REFERENCE TREE	COMMENTS
3.2.1.1.1.39	Alarm	Tank Flammable Gas Concentration	AP.14.2, Not Assessed	New System (SHMS)
3.2.1.1.1.40 3.2.1.2.4 3.2.1.2.5	Control (Maintain, Adjust)	Tank Flammable Gas Concentration Tank Ventilation System Airflow	Not Assessed re: AP.12.1.5 & AP.12.1.6	Administrative function. Trade Study should assess need for tie-in to new HVAC control system.
3.2.1.1.1.41	Monitor	Untreated Gaseous Effluent Temperature	AP.12.1.3	Also see AP.12.1.4, Heater Control System
3.2.1.1.1.42	Monitor	Treated Gaseous Effluent Radionuclide Particulate Concentrations	AP.12.1.8	
3.2.1.1.1.42	Monitor	Treated Gaseous Effluent Temperature	AP.12.1.8	
3.2.1.1.1.42	Monitor	Treated Gaseous Effluent Moisture level	Non-existent architecture	
3.2.1.1.1.42	Monitor	Treated Gaseous Effluent Organic Vapor Concentration	Non-existent architecture	
3.2.1.1.1.42	Monitor	Treated Gaseous Effluent Hazardous/ Toxic Vapor - Particulate Concentrations	Non-existent architecture	

PROJECT W-314 PDRD CROSS REFERENCED TABLE INSTRUMENT & CONTROL SYSTEMS				
PDRD FUNCTION ID#	PDRD FUNCTION VERB	PDRD DATA VARIABLE	EQUIPMENT REFERENCE TREE	COMMENTS
3.2.1.1.1.43(1)	Compare	Treated Gaseous Effluent Radionulide Particulate Concentrations	AP.12.1.8 See HVAC Assessment	
3.2.1.1.1.43	Compare	Treated Gaseous Effluent Temperature	AP.12.1.8 See HVAC Assessment	
3.2.1.1.1.43	Compare	Treated Gaseous Effluent Moisture Level	Non-existent architecture	
3.2.1.1.1.43	Compare	Treated Gaseous Effluent Organic Vapor Concentration	Non-existent architecture	
3.2.1.1.1.43(2)	Compare	Treated Gaseous Effluent Hazardous/ Toxic Vapor - Particulate Concentrations	Non-existent architecture	
3.2.1.1.1.44	Alarm	Treated Gaseous Effluent Radionulide Particulate Concentrations	AP.12.1.8	Recorders in 242-A. Data should be tied into TMACS
3.2.1.1.1.44	Alarm	Treated Gaseous Effluent Temperature	Not Assessed	
3.2.1.1.1.44	Alarm	Treated Gaseous Effluent Moisture Level	Non-existent architecture	

PROJECT W-314 PDRD CROSS REFERENCED TABLE INSTRUMENT & CONTROL SYSTEMS				
PDRD FUNCTION ID#	PDRD FUNCTION VERB	PDRD DATA VARIABLE	EQUIPMENT REFERENCE TREE	COMMENTS
3.2.1.1.1.44	Alarm	Treated Gaseous Effluent Organic Vapor Concentration	Non-existent architecture	
3.2.1.1.1.44	Alarm	Treated Gaseous Effluent Hazardous/ Toxic Vapor - Particulate Concentrations	Non-existent architecture	
3.2.1.1.1.45	Control	Treated Gaseous Effluent Radionuclide Particulate Concentrations	Not Assessed re: AP.12.1.5 & AN.12.1.6	Administrative function.
3.2.1.1.1.45	Control	Treated Gaseous Effluent Temperature	Not Assessed	Administrative function.
3.2.1.1.1.45 3.2.1.2.7	Control	Treated Gaseous Effluent Moisture Level (indirectly) Tank Ventilation System	Non-existent architecture	Administrative function.
3.2.1.1.1.45	Control	Treated Gaseous Effluent Organic Vapor Concentration	Non-existent architecture	Administrative function.
3.2.1.1.1.45 3.2.1.2.8	Control	Treated Gaseous Effluent Hazardous/ Toxic Vapor - Particulate Concentrations (indirectly) Tank Ventilation System	Non-existent architecture	Administrative function.

PROJECT W-314 PDRD CROSS REFERENCED TABLE INSTRUMENT & CONTROL SYSTEMS				
PDRD FUNCTION ID#	PDRD FUNCTION VERB	PDRD DATA VARIABLE	EQUIPMENT REFERENCE TREE	COMMENTS
3.2.1.1.2.2	Monitor	Essential Transfer Tank Systems/Equipment Operability Status (eg. vent. sys., waste level monitor, etc)	Non-existent architecture	Presently, Operator rounds required.
3.2.1.1.2.3	Monitor	Essential Interconnecting Systems/Equipment Operability Status (eg. heat trace, valves, pumps, etc)	AP.16, Not Assessed	Presently, Operator rounds required.
3.2.1.1.2.4	Monitor	Transfer System Operability Status (leak detection system)	AP.11.3 AP.11.4	Presently, Operator rounds required.
3.2.1.1.2.5	Monitor	Essential Equipment Operability Status	AP.16	Presently, Operator rounds required.
3.2.1.1.2.6	Monitor	Waste Parameters Temperature Viscosity Specific Gravity	AP.14 AP.14.1 AP.14.3	
3.2.1.1.2.7	Detect	Waste Transfer System Containment Leaks	AP.11.3	
3.2.1.1.2.8	Monitor	Effluents	Non-existent architecture	No effluents in the Tank Farm. Service pit monitors water flow utilized for washdown.
3.2.1.1.2.9	Monitor	Motive Force	See Electrical Assessment (re: AP.13.1)	Manual ON-OFF controls, local indicators of ON-OFF condition.
3.2.1.1.2.9	Control	Motive Force	See Electrical Assessment (re: AP.13.1)	Manual ON-OFF controls, local indicators of ON-OFF condition.

PROJECT W-314 PDRD CROSS REFERENCED TABLE INSTRUMENT & CONTROL SYSTEMS				
PDRD FUNCTION ID#	PDRD FUNCTION VERB	PDRD DATA VARIABLE	EQUIPMENT REFERENCE TREE	COMMENTS
3.2.1.1.2.10	Monitor	Transfer Route Isolation Devices	I&C Non-existent architecture See Pipeline Assessment (re: AP.13.3)	Manual Indication
3.2.1.1.2.10	Control	Transfer Route Isolation Devices	I&C Non-existent Architecture See Pipeline Assessment (re: AP.13.3)	Manual Operation.
3.2.1.1.2.11	Monitor	Transfer Line Waste Flow Rate	Non-existent architecture	Equipment doesn't exist.
3.2.1.1.2.12	Monitor & Compare (Verify)	Transfer Volume	Non-existent architecture	Administrative function.
3.2.1.1.2.13	Alarm (Annunciate)	Waste Transfer System-Structure- Component Fault(s)	AP.11.5	Administrative function. Alarm Status assessed via Operator rounds & via CASS reports.
3.2.1.1.14	Control (Activate)	Waste Transfer Safe Shutdown Systems	AP.11.4	
3.2.1.1.2.15	Monitor & Compare (Verify)	Waste Transfer System Safe Shutdown	Non-existent architecture	Function not implemented with I & C.
3.2.1.1.2.16	Control (Secure)	Failed Waste Transfer System Equipment	Non-existent architecture	Function not implemented with I & C.
3.2.1.1.3	Manage Obtain Analyze Process Store Archive	System Data/Information	Data Acquisition System Not Assessed AP.11.2.1.4 AP.12.1.1.5 AP.11.6 (re: AP.14.4.5)	Chart recorders in 241-AP-271 should be functionally replaced.
3.2.1.2.3.1	Monitor	Tank Annulus Pressure	AP.12.2.1 See HVAC Assessment	Existing equipment is manual. data needs to be connected to TMACS.

PROJECT W-314 PDRD CROSS REFERENCED TABLE INSTRUMENT & CONTROL SYSTEMS				
PDRD FUNCTION ID#	PDRD FUNCTION VERB	PDRD DATA VARIABLE	EQUIPMENT REFERENCE TREE	COMMENTS
3.2.1.2.3.1	Control (Maintain)	Tank Annulus Pressure	Not Assessed	Manual operator function.
3.2.1.3.4	Monitor	Waste Transfer System Containment Pressure	Non-existent architecture re: AP.13.4 See Pipeline Assessment	
3.2.1.3.4	Control	Waste Transfer System Containment Pressure	Non-existent architecture See Pipeline Assessment	
3.3.1.2.3.1	Monitor	Sludge Volume	AP.14.5 Not Assessed	
3.3.4.1.6	Monitor	CAMs Radiation Remote Centralized Data & Alarm Display	Not Assessed	Personel protection monitoring is not monitored by TMACS. Local indication only.

4.2 Functions Assessment Tables

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EXISTING TANK FARM EQUIPMENT FUNCTIONS ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS						
REF. NO	SYSTEM NAME	FUNCTION OR CONSTRAINT			METHOD OF ANALYSIS I. Analysis II. Inspection III. Testing	BRIEF REASON FOR DECISION
		DESCRIPTION	SOURCE	MET		
AP.11	LEAK CONTROL SYSTEM	3.2.1.1.2.4 3.2.3.3 3.2.3.4	PDRD	NO	I. See the Engineering Analysis	Verification of the operability of the transfer route leak sensors is not reliable because of the design of the liquid presence sensors and the manual process utilized to test each sensor. These sensors can not be calibrated.
AP.11.1	LEAK DET. PIT/SUMP INST.					
AP.11.1.1	Gamma Radiation Monitoring Subsystem	3.2.1.1.1.17	PDRD	NO	I. See the Engineering Analysis. IIa. See Field Inspection Questionnaire. IIb. See CAS Data Sheets.	The instrument thimble often contains water due to condensation and possible rainwater infiltration. The relation between the output indication of this system and leak rate detection is not well defined. Sensor connectors and their cable are sometimes underwater. This system is not designed for submerged use. Cable life expectancy in this environment is poor.
AP.11.1.2	Weight Factor & Specific Gravity Monitoring Subsystem	3.2.1.1.1.17	PDRD	NO	I. See the Engineering Analysis. IIa. See Field Inspection Questionnaire. IIb. See Inst. CAS Data Sheets.	This is complex pneumatic technology that does not directly measure liquid surface level. Better instrumentation exists that does not use instrument air. Potential degradation of inst. air piping may lead to a degradation of inst. air quality with subsequent pneumatic inst. problems. A Trade Study should be carried out to verify the need for this architecture.
AP.11.1.3	Liquid Presence Sensor and Buried wiring	3.2.1.1.2.7	1. PDRD, WAC-173-303- #160(4)(c)(iii), 40CFR-Ch1- #265.193(c)(3)	NO	I. See the Engineering Analysis. IIa. See Field Inspection Questionnaire. IIb. See Elec & Inst. CAS Data Sheets.	The existing device will not measure low leak rates due to its design.
AP.11.1.4	Liquid Temperature Sensor	3.2.1.1.1.17	PDRD	YES	I. See the Engineering Analysis.	Although this device meets PDRD requirements, it could be eliminated as redundant instr. as it adds little value to leak detection.
AP.11.2	ANNULUS LEAK INSTRUMENTATION	Secondary Containment Leak Detection	1. 40CFR- CH1-#265.193(c)(3), WAC-173-303	NO	I. See the Engineering Analysis.	Leakage from secondary tank walls may be absorbed in the soil. Secondary containment floor leaks may be detected by the Leak Detection Pit systems.

**EXISTING TANK FARM EQUIPMENT
FUNCTIONS ASSESSMENT TABLE**
INSTRUMENTS & CONTROL SYSTEMS

REF. NO.	SYSTEM NAME	FUNCTION OR CONSTRAINT			METHOD OF ANALYSIS I. Analysis II. Inspection III. Testing	BRIEF REASON FOR DECISION
		DESCRIPTION	SOURCE	MET		
AP.11	LEAK CONTROL SYSTEM	3.2.1.1.2.4 3.2.3.3 3.2.3.4	PDRD	NO	I. See the Engineering Analysis	Verification of the operability of the transfer route leak sensors is not reliable because of the design of the liquid presence sensors and the manual process utilized to test each sensor. These sensors can not be calibrated.
AP.11.1	LEAK DET. PIT/SUMP INST.					
AP.11.1.1	Gamma Radiation Monitoring Subsystem	3.2.1.1.1.17	PDRD	NO	I. See the Engineering Analysis. IIa. See Field Inspection Questionnaire. IIb. See CAS Data Sheets.	The instrument thimble often contains water due to condensation and possible rainwater infiltration. The relation between the output indication of this system and leak rate detection is not well defined. Sensor connectors and their cable are sometimes underwater. This system is not designed for submerged use. Cable life expectancy in this environment is poor. This system is too sensitive to Radon gas, which yields excessive false alarms. System beta/gamma sensitivity specification is somewhat arbitrary (see WHC TI-357; 600 CMP = 3 * BASELINE). Maintenance/calibration of the analyzer is difficult because of lifting requirements. A partial upgrade may be appropriate. The data recorder requires extensive maintenance. A Trade Study should be carried out to determine the efficiency of this type of instrument and the appropriateness for this application.
AP.11.2.1	Annulus CAM Radiation Monitoring Subsystem	3.2.1.1.1.17	PDRD, 40CFR-CH1, #265.193(c)(3), WAC-173-303	YES ¹	I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	The device is manually operated. Thus the level detected is subject to operator interpretation & the resolution is poor. Monitoring Frequency requirements suggest a need for automatic monitoring & recording. This device requires an Operator to enter the farm to operate. This device is a very large consumer of Inst. Air. This device housing is damaged by UV radiation. The basic Design is a problem.
AP.11.2.2	Liquid Presence Sensor (Flare Box & Manual Taps Conductivity Probel)	3.2.1.1.1.17	1. PDRD, WAC-173-303-#150(4)(c)(iii), 40CFR-CH1, #265.193(c)(3)	NO	I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	

**EXISTING TANK FARM EQUIPMENT
FUNCTIONS ASSESSMENT TABLE**
INSTRUMENTS & CONTROL SYSTEMS

REF. NO	SYSTEM NAME	FUNCTION OR CONSTRAINT			METHOD OF ANALYSIS I. Analysis II. Inspection III. Testing	BRIEF REASON FOR DECISION
		DESCRIPTION	SOURCE	MET		
AP.11	LEAK CONTROL SYSTEM	3.2.1.1.2.4 3.2.3.3 3.2.3.4	PDRD	NO	I. See the Engineering Analysis	Verification of the operability of the transfer route leak sensors is not reliable because of the design of the liquid presence sensors and the manual process utilized to test each sensor. These sensors can not be calibrated.
AP.11.1	LEAK DET. PIT/SUMP INST.					
AP.11.1.1	Gamma Radiation Monitoring Subsystem	3.2.1.1.1.17	PDRD	NO	I. See the Engineering Analysis. IIa. See Field Inspection Questionnaire. IIb. See CAS Data Sheets.	The instrument thimble often contains water due to condensation and possible rainwater infiltration. The relation between the output indication of this system and leak rate detection is not well defined. Sensor connectors and their cable are sometimes underwater. This system is not designed for submerged use. Cable life expectancy in this environment is poor.
AP.11.2.3	Annulus Pump Pit Liquid Presence Sensor	3.2.1.1.2.7	PDRD	NO	I. See the Engineering Analysis.	See AP.11.3.3
AP.11.3	PIPELINE LEAK INSTRUMENTATION	3.2.1.1.2.7 Secondary Containment Leak Detection	PDRD WAC-173-303#160(4)(c)(iii) 40CFR-CH1#265.193(c)(3)	NO	I. See the Engineering Analysis.	The detection system cannot detect a failure of pipeline secondary containment. The detection system cannot detect a failure of the various "Transfer Pits". A Trade Study should pull together the various environmental interpretations, permits and waiver request to confirm the need for this type of system.
AP.11.3.1	C.O.B. Liquid Presence Sensor	3.2.1.1.2.7	PDRD WAC-173-303-#160(4)(c)(iii), 40CFR-Ch1-#265.193(c)(3)	NO	I. See the Engineering Analysis. IIb. See Elec. CAS Data Sheets.	The existing sensor will not detect low leak rates due to its design. Its operability cannot be easily verified (manual drenching with water is required) and it cannot be tested function with existing electrical circuitry. Current sensitive relays are not (& cannot be) calibrated with the sensor.
AP.11.3.2	Pipeline Pressure Switch Sensor	3.2.1.1.2.10 3.2.1.3.4	PDRD	NO NO	I. See the Engineering Analysis.	It is believed that adequate "status of the route isolation" is not provided for all the transfer routes. This will require an Engineering analysis to determine if more pressure switches are required.

**EXISTING TANK FARM EQUIPMENT
FUNCTIONS ASSESSMENT TABLE**
INSTRUMENTS & CONTROL SYSTEMS

REF. NO	SYSTEM NAME	FUNCTION OR CONSTRAINT			METHOD OF ANALYSIS I. Analysis II. Inspection III. Testing	BRIEF REASON FOR DECISION
		DESCRIPTION	SOURCE	MET		
AP-11	LEAK CONTROL SYSTEM	3.2.1.1.2.4 3.2.3.3 3.2.3.4	PDRD	NO	I. See the Engineering Analysis	Verification of the operability of the transfer route leak sensors is not reliable because of the design of the liquid presence sensors and the manual process utilized to test each sensor. These sensors can not be calibrated.
AP-11.1	LEAK DET. PIT/SUMP INST.					
AP-11.1.1	Gamma Radiation Monitoring Subsystem	3.2.1.1.1.17	PDRD	NO	I. See the Engineering Analysis. IIa. See Field Inspection Questionnaire. IIb. See CAS Data Sheets.	The instrument thimble often contains water due to condensation and possible rainwater infiltration. The relation between the output indication of this system and leak rate detection is not well defined. Sensor connectors and their cable are sometimes underwater. This system is not designed for submerged use. Cable life expectancy in this environment is poor.
AP-11.3.3	Transfer Pits: Liquid Presence Sensor	3.2.1.1.2.7	PDRD WAC-173-303- #160(d)(4)(c)(iii), 40CFR-Ch1- #265.193(c)(3)	NO	I. See the Engineering Analysis. IIa. See Field Inspection Questionnaire. IIb. See Elec. CAS Data Sheets.	The sensor will not detect low leak rates due to its design. Its operability cannot be easily verified (manual drenching with water is required) and it cannot be tested function with existing electrical circuitry. Rain and melting snow infiltration through cover blocks are often causes of false alarms. Current sensitive relays are not (& cannot be) calibrated with the sensor. In the pump pit of tanks with flammable atmosphere, there is a concern that this system may be an ignition source.
AP-11.3.5	Service Pit Instruments (LDE only)	3.2.1.1.2.7	PDRD	NO	See AP-11.3.3	See AP-11.3.3
AP-11.4	PUMP PERMISSIVE INSTRUMENTATION (241-AP-271 Master Pump Shutdown Relay Panel)	3.2.1.1.2.9 3.2.1.1.2.10 3.2.1.3.10	PDRD	NO	I. See the Engineering Analysis.	The existing system does not allow interlock versatility. (Its all or nothing.) You can not set up a transfer route and have only the appropriate leak sensors for that route active.
AP-11.4.4	[242-A Relay Panel]	3.2.1.1.2.9 3.2.1.1.2.10 3.2.1.3.10	PDRD	NO	I. See the Engineering Analysis.	This system ties the East Area tank farms together and does not allow interlock versatility. (Its all or nothing.) You can not easily isolate farms for a waste transfer route and have only the appropriate leak sensors for that route active.

**EXISTING TANK FARM EQUIPMENT
FUNCTIONS ASSESSMENT TABLE**
INSTRUMENTS & CONTROL SYSTEMS

REF. NO	SYSTEM NAME	FUNCTION OR CONSTRAINT			METHOD OF ANALYSIS I. Analysis II. Inspection III. Testing	BRIEF REASON FOR DECISION
		DESCRIPTION	SOURCE	MET		
AP.11	LEAK CONTROL SYSTEM	3.2.1.1.2.4 3.2.3.3 3.2.3.4	PDRD	NO	I. See the Engineering Analysis	Verification of the operability of the transfer route leak sensors is not reliable because of the design of the liquid presence sensors and the manual process utilized to test each sensor. These sensors can not be calibrated.
AP.11.1	LEAK DET. PT./SUMP INST.					
AP.11.1.1	Gamma Radiation Monitoring Subsystem	3.2.1.1.1.17	PDRD	NO	I. See the Engineering Analysis. IIa. See Field Inspection Questionnaire. IIb. See CAS Data Sheets.	The instrument thimble often contains water due to condensation and possible rainwater infiltration. The relation between the output indication of this system and leak rate detection is not well defined. Sensor connectors and their cable are sometimes underwater. This system is not designed for submerged use. Cable life expectancy in this environment is poor.
AP.11.5	LOCAL ALARM ANNUNCIATION & ALARM PANELS (241-AP-271 & 242-A)	3.2.1.1.2.2 3.2.1.1.2.3 3.2.1.1.2.4 3.2.1.1.2.5 3.2.1.1.2.13 3.2.1.1.3	PDRD	NO	I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	System indicators, in general, do not appear to comply with NUREG-0700 design guidelines which deal with alarm identification. Replacement of the leak detection & M.P.S. systems may render part of the old PANALARM non-functional. re: AP.11.5.3 This system relies on old (~17 yrs) Hanford designed communications equipment to interface to the CASS system. It is obsolete and parts procurement is difficult.
AP.11.6	REMOTE ALARM SIGNALING (GAMEWELL LOOP)	3.2.1.1.3	PDRD	NO	I. See the Engineering Analysis. IIa. See Field Inspection Questionnaire.	This Signaling system does not allow identification of individual leak sensing elements. The system has a long history of maintenance problems. It is obsolete and parts procurement is difficult.
AP.11.7	TANK WASTE HIGH LEVEL ALARM SUBSYSTEM	3.2.1.1.1.5	PDRD	NO	I. See the Engineering Analysis.	Verification of the operability of these high level sensors is not reliable because of the design of the liquid presence sensor. These sensors can not be calibrated. In tanks with flammable atmosphere there is concern that this system may be an ignition source. Current sensitive relays are not (& cannot be) calibrated with the sensor.
AP.12	VENTILATION CONTROL SYSTEM					

**EXISTING TANK FARM EQUIPMENT
FUNCTIONS ASSESSMENT TABLE**
INSTRUMENTS & CONTROL SYSTEMS

REF. NO	SYSTEM NAME	FUNCTION OR CONSTRAINT			METHOD OF ANALYSIS I. Analysis II. Inspection III. Testing	BRIEF REASON FOR DECISION
		DESCRIPTION	SOURCE	MET		
AP.11	LEAK CONTROL SYSTEM	3.2.1.1.2.4 3.2.3.3 3.2.3.4	PDRD	NO	I. See the Engineering Analysis	Verification of the operability of the transfer route leak sensors is not reliable because of the design of the liquid presence sensors and the manual process utilized to test each sensor. These sensors can not be calibrated.
AP.11.1	LEAK DET. PIT/SUMP INST.					
AP.11.1.1	Gamma Radiation Monitoring Subsystem	3.2.1.1.1.17	PDRD	NO	I. See the Engineering Analysis. IIa. See Field Inspection Questionnaire. IIb. See CAS Data Sheets.	The instrument thimble often contains water due to condensation and possible rainwater infiltration. The relation between the output indication of this system and leak rate detection is not well defined. Sensor connectors and their cable are sometimes underwater. This system is not designed for submerged use. Cable life expectancy in this environment is poor.
AP.12.1	TANK PRIMARY VENTILATION SYSTEM					
AP.12.1.1	Tank Diff. Pressure Instr. Subsystem	3.2.1.1.1.33 3.2.1.1.1.34 3.2.1.1.1.35	PDRD	YES ¹	I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	The pressure sensors are OK. ¹ The system should be reviewed to determine if it is possible to eliminate purge air. The chart recorders should be tied into TMACS for data acquisition.
AP.12.1.2	HEPA Filter Diff. Pressure Instr.	3.2.1.2.9 3.2.3	PDRD	NO	I. See the Engineering Analysis.	Record keeping of filter degradation requires manual data gathering. No electronic database capability is available. Automatic data acquisition should be considered.
AP.12.1.3	Temperature Instrumentation	3.2.1.1.1.41 3.2.3	PDRD	NO	See below.	Record keeping of temperature data requires manual data gathering. No electronic database capability is available. Automatic data acquisition should be considered.
AP.12.1.4	Heater Control Subsystem	3.2.1.1.1.41	PDRD	NO	I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	Heater controls require extensive maintenance, and cannot be calibrated. Temperature probes have high failure rates. Automatic data acquisition should be considered.

EXISTING TANK FARM EQUIPMENT FUNCTIONS ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS						
REF. NO	SYSTEM NAME	FUNCTION OR CONSTRAINT			METHOD OF ANALYSIS I. Analysis II. Inspection III. Testing	BRIEF REASON FOR DECISION
		DESCRIPTION	SOURCE	MET		
AP.11	LEAK CONTROL SYSTEM	3.2.1.1.2.4 3.2.3.3 3.2.3.4	PDRD	NO	I. See the Engineering Analysis	Verification of the operability of the transfer route leak sensors is not reliable because of the design of the liquid presence sensors and the manual process utilized to test each sensor. These sensors can not be calibrated.
AP.11.1	LEAK DET. PIT/SUMP INST.					
AP.11.1.1	Gamma Radiation Monitoring Subsystem	3.2.1.1.1.17	PDRD	NO	I. See the Engineering Analysis. IIa. See Field Inspection Questionnaire. IIb. See CAS Data Sheets.	The instrument thimble often contains water due to condensation and possible rainwater infiltration. The relation between the output indication of this system and leak rate detection is not well defined. Sensor connectors and their cable are sometimes underwater. This system is not designed for submerged use. Cable life expectancy in this environment is poor.
AP.12.1.5	Fan-Motor Control Subsystem	3.2.1.2.9 3.2.1.2.10 3.2.3	PDRD	YES ¹	See HVAC	¹ Automatic data acquisition for control position should be considered.
AP.12.1.6	Damper Control Subsystem	3.2.1.2.10	PDRD	YES ¹	See HVAC assessment.	¹ Automatic data acquisition for control position should be considered.
AP.12.1.8	Regulated Stack Monitoring System	3.2.1.1.1.42 Inst. Sensitivity (DCG)	PDRD WHC-SD-EN-TI-288	NO	I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	System does not comply with WDOE requirements.
AP.12.2	TANK ANNULUS VENTILATION SYSTEM					(See HVAC section.)
AP.12.2.1	Annulus Diff. Pressure Inst. Subsystem	3.2.1.2.3.1	PDRD	NO	I. See the Engineering Analysis.	The existing system is manually read in the farm. The interaction between the primary ventilation system and the annular ventilation on the primary tank wall must be manually computed.
AP.13	TRANSFER LINE CONTROL SYSTEM	3.2.1.1.2.5 3.2.1.1.2.8	PDRD	NO	I. See the Engineering Analysis.	Effluents are not monitored.
AP.13.1	PUMP CONTROL SUBSYSTEM	3.2.1.1.2.9	PDRD	NO	I. See the Engineering Analysis.	Monitoring of Motive Force Devices is minimal, eg. no current monitoring is carried out.

EXISTING TANK FARM EQUIPMENT
FUNCTIONS ASSESSMENT TABLE
INSTRUMENTS & CONTROL SYSTEMS

REF. NO	SYSTEM NAME	FUNCTION OR CONSTRAINT			METHOD OF ANALYSIS I. Analysis II. Inspection III. Testing	BRIEF REASON FOR DECISION
		DESCRIPTION	SOURCE	MET		
AP.11	LEAK CONTROL SYSTEM	3.2.1.1.2.4 3.2.3.3 3.2.3.4	PDRD	NO	I. See the Engineering Analysis	Verification of the operability of the transfer route leak sensors is not reliable because of the design of the liquid presence sensors and the manual process utilized to test each sensor. These sensors can not be calibrated.
AP.11.1	LEAK DET. PIT/SUMP INST.					
AP.11.1.1	Gamma Radiation Monitoring Subsystem	3.2.1.1.1.17	PDRD	NO	I. See the Engineering Analysis. IIa. See Field Inspection Questionnaire. IIb. See CAS Data Sheets.	The instrument thimble often contains water due to condensation and possible rainwater infiltration. The relation between the output indication of this system and leak rate detection is not well defined. Sensor connectors and their cable are sometimes underwater. This system is not designed for submerged use. Cable life expectancy in this environment is poor.
AP.13.2	VALVE POSITION INSTRUMENTATION - INDICATION (No automation)	3.2.1.1.2.10	PDRD	NO	I. See the Engineering Analysis.	Electronic Feedback of route isolation status does not exist. The Valve Position Monitoring System (VPMDS) was removed from service. Transfer route identification cannot be electronically verified because valve position is not remotely monitored. Main Valve Pits have limits switches but they are troublesome. New technology exists which could provide continuous position indication.
AP.13.3	VALVE CONTROL SYSTEM	3.2.1.1.2.10	PDRD	NO	I. See the Engineering Analysis.	With a few exceptions, motorized valve control does not exist.
AP.13.4	PRESSURE SWITCH INSTRUMENTATION (Flow Indication)	3.2.1.1.2.9	PDRD	NO	I. See the Engineering Analysis.	Requirements for pipeline pressure sensor for monitoring misrouting is not clearly defined in the PDRD. Transfer route identification cannot be electronically verified because all pipelines are not monitored for pressure or flow. The PDRD should clarify the requirement for this data function.
AP.13.5	WASTE FLOW MONITORING INSTRUMENTATION (Service Pit & Flush Pit)	3.2.1.1.2.11	PDRD	NO	I. See the Engineering Analysis.	Waste Flow Instrumentation, in general, does not exist. The PDRD should more clearly specify which pipelines should have this measurement function.

EXISTING TANK FARM EQUIPMENT FUNCTIONS ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS						
REF. NO	SYSTEM NAME	FUNCTION OR CONSTRAINT			METHOD OF ANALYSIS I. Analysis II. Inspection III. Testing	BRIEF REASON FOR DECISION
		DESCRIPTION	SOURCE	MET		
AP.11	LEAK CONTROL SYSTEM	3.2.1.1.2.4 3.2.3.3 3.2.3.4	PDRD	NO	I. See the Engineering Analysis	Verification of the operability of the transfer route leak sensors is not reliable because of the design of the liquid presence sensors and the manual process utilized to test each sensor. These sensors can not be calibrated.
AP.11.1	LEAK DET. PIT/SUMP INST.					
AP.11.1.1	Gamma Radiation Monitoring Subsystem	3.2.1.1.1.17	PDRD	NO	I. See the Engineering Analysis. IIa. See Field Inspection Questionnaire. IIb. See CAS Data Sheets.	The instrument thimble often contains water due to condensation and possible rainwater infiltration. The relation between the output indication of this system and leak rate detection is not well defined. Sensor connectors and their cable are sometimes underwater. This system is not designed for submerged use. Cable life expectancy in this environment is poor.
AP.13.5.1	Service Pit Instrument Subsystems					
AP.13.5.1.1	Flow Monitor & Totalizer	3.2.1.1.2.11	PDRD	NO	I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	The flow totalizer cannot detect small flow rates (less than 5 gpm).
AP.13.5.1.2	Radiation (Gamma) Monitor					Not Assessed. The PDRD does not clearly require this function.
AP.13.5.1.3	Pipeline Pressure	3.2.1.1.2.9	PDRD		Relates to AP.13.4	Not Assessed.
AP.14	TANK CONTENTS MONITORING SYSTEM	3.2.1.1.2.6	PDRD	NO	I. See the Engineering Analysis.	In most cases, real time monitoring systems for these parameters do not exist, i.e viscosity, specific gravity, etc.
AP.14.1	TEMPERATURE/VAPOR INSTRUMENTATION	3.2.1.1.1.9 3.2.1.1.1.25 3.2.1.2.1.1	PDRD	NO	I. See the Engineering Analysis.	Temperature trees that do not have removable sensors are candidates for replacement. These types of Trees can not be repaired. All existing trees cannot withstand mixer pump forces.

EXISTING TANK FARM EQUIPMENT FUNCTIONS ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS						
REF. NO	SYSTEM NAME	FUNCTION OR CONSTRAINT			METHOD OF ANALYSIS I. Analysis II. Inspection III. Testing	BRIEF REASON FOR DECISION
		DESCRIPTION	SOURCE	MET		
AP.11	LEAK CONTROL SYSTEM	3.2.1.1.2.4 3.2.3.3 3.2.3.4	PDRD	NO	I. See the Engineering Analysis	Verification of the operability of the transfer route leak sensors is not reliable because of the design of the liquid presence sensors and the manual process utilized to test each sensor. These sensors can not be calibrated.
AP.11.1	LEAK DET. PIT/SUMP INST.					
AP.11.1.1	Gamma Radiation Monitoring Subsystem	3.2.1.1.1.17	PDRD	NO	I. See the Engineering Analysis. IIa. See Field Inspection Questionnaire. IIb. See CAS Data Sheets.	The instrument thimble often contains water due to condensation and possible rainwater infiltration. The relation between the output indication of this system and leak rate detection is not well defined. Sensor connectors and their cable are sometimes underwater. This system is not designed for submerged use. Cable life expectancy in this environment is poor.
AP.14.4	TANK LIQUID SURFACE LEVEL INSTRUMENTATION (Enraf is scheduled to be installed in this farm soon.)	3.2.1.1.1.5 3.2.1.1.1.13 3.2.1.1.2.12	PDRD	NO	I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	This device must satisfy the need for Mass Balance & Tank Inventory measurements. This device is used to detect/confirm liquid leaks and liquid intrusions. The existing FIC gauges achieve poor resolution and require extensive maintenance. The Enraf device was not assessed at this time. However, the Enraf CIU will be required to send digital data directly to TMACS Central in order to remotely report a full range (top level in tank to bottom of tank).
AP.14.5	SLUDGE WEIGHT (LEVEL) MONITORING	3.2.1.1.1.1	PDRD	YES	I. See the Engineering Analysis.	This device is expensive to fabricate. It requires an Operator to enter the farm to operate. The level data obtained is subject to Operator interpretation and the resolution is poor. A Trade Study should determine if this device should be automated.
AP.15	TANK CONTENTS MIXING SYSTEMS	Not in PDRD			I. See the Engineering Analysis.	This function is missing from the PDRD and should be added.
AP.15.1	AIR LIFT CIRCULATOR CONTROL SYSTEM					

**EXISTING TANK FARM EQUIPMENT
FUNCTIONS ASSESSMENT TABLE**
INSTRUMENTS & CONTROL SYSTEMS

REF. NO	SYSTEM NAME	FUNCTION OR CONSTRAINT			METHOD OF ANALYSIS I. Analysis II. Inspection III. Testing	BRIEF REASON FOR DECISION
		DESCRIPTION	SOURCE	MET		
AP.11	LEAK CONTROL SYSTEM	3.2.1.1.2.4 3.2.3.3 3.2.3.4	PDRD	NO	I. See the Engineering Analysis	Verification of the operability of the transfer route leak sensors is not reliable because of the design of the liquid presence sensors and the manual process utilized to test each sensor. These sensors can not be calibrated.
AP.11.1	LEAK DET. PIT/SUMP INST.					
AP.11.1.1	Gamma Radiation Monitoring Subsystem	3.2.1.1.1.17	PDRD	NO	I. See the Engineering Analysis. IIa. See Field Inspection Questionnaire. IIb. See CAS Data Sheets.	The instrument thimble often contains water due to condensation and possible rainwater infiltration. The relation between the output indication of this system and leak rate detection is not well defined. Sensor connectors and their cable are sometimes underwater. This system is not designed for submerged use. Cable life expectancy in this environment is poor.
AP.15.1.1	DIFF. PRESSURE SENSORS				I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	These sensors are manually read. A Trade Study should determine if the data acquisition should be automated.
AP.16	SCC STATUS/MONITORING SYSTEM AC POWER SUPPLY STATUS AIR SUPPLY STATUS WATER SUPPLY STATUS HEAT TRACE SYS. STATUS CATHODIC PROT. SYS. STATUS Other	3.2.1.1.2.1 3.2.1.1.2.3	PDRD	NO	I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	A status summary alarm panel for all these subsystems doesn't exist. Some status are available on the old PANALARM panels. Some of the data is obtained by Operator rounds. Replacement of the various instrument systems may render much of the old PANALARM non-functional.
AP.16.4	TANK CONCRETE STRUCTURE TEMPERATURE INST.	3.2.1.1.1.29 3.2.1.2.1.1.2	PDRD	NO	I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	The data loggers are obsolete. Spare parts procurement are a problem. (A new TMAACS design for AW farm could provide some monitoring of these Thermocouples.) The PDRD should specify which thermocouples require real-time monitoring.
AP.17	HEAT TRACE CONTROL SYSTEM	3.2.1.3	PDRD	NO	I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	Some of the Transfer Lines have broken heat traces. The PDRD should reassess the need for this system.

EXISTING TANK FARM EQUIPMENT FUNCTIONS ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS						
REF. NO	SYSTEM NAME	FUNCTION OR CONSTRAINT			METHOD OF ANALYSIS I. Analysis II. Inspection III. Testing	BRIEF REASON FOR DECISION
		DESCRIPTION	SOURCE	MET		
AP.11	LEAK CONTROL SYSTEM	3.2.1.1.2.4 3.2.3.3 3.2.3.4	PDRD	NO	I. See the Engineering Analysis	Verification of the operability of the transfer route leak sensors is not reliable because of the design of the liquid presence sensors and the manual process utilized to test each sensor. These sensors can not be calibrated.
AP.11.1	LEAK DET. PT/SUMP INST.					
AP.11.1.1	Gamma Radiation Monitoring Subsystem	3.2.1.1.1.17	PDRD	NO	I. See the Engineering Analysis. IIa. See Field Inspection Questionnaire. IIb. See CAS Data Sheets.	The instrument thimble often contains water due to condensation and possible rainwater infiltration. The relation between the output indication of this system and leak rate detection is not well defined. Sensor connectors and their cable are sometimes underwater. This system is not designed for submerged use. Cable life expectancy in this environment is poor.
AP.18	CATHODIC PROTECTION SYSTEM	3.2.1.3.5 Testing requirement	PDRD WAC-173-303 #640	NO ¹	I. See the Engineering Analysis.	The existing system doesn't seem to comply with the testing capability requirements for cathodic protection systems i.a.w. WAC. ¹ A partial upgrade may be appropriate.

4.3 Architecture Tree Tables

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Level 1

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Level 3

Level 4

Level 2

LEAK CONTROL
SYSTEM
AP.11

Level 3

ANNULUS LEAK
INSTRUMENTATION
AP.11.2

Level 4

CAM Radiation
Monitoring
Subsystem
AP.11.2.1

Level 5

Air Sampler
Probe/Tubing/etc
AP.11.2.1.1

Radiation
Analyzer
AP.11.2.1.2

Cabinet
(Vent. Ptl)
AP.11.2.1.3

1-Pen Recorder
& Alarms
(241-AP-271)
AP.11.2.1.4

Signal
Wiring/Conduit
AP.11.2.1.5

Level 2

Level 3

Level 4

Level 2

Level 3

Level 4

Level 5

Level 2

Level 3

Level 4

Level 2

Level 3

Level 4

Level 2

LEAK CONTROL
SYSTEM
AP.11

Level 3

TANK WASTE
HIGH LEVEL
ALARM SUBSYSTEM
AP.11.7

Level 4

Waste Liquid
High Level
Probe
AP.11.7.1

High Level
Alarm Relays
AP.11.7.2

Wiring/Conduit/TBX
AP.11.7.3

Level 2

Level 3

Level 2

Level 3

Level 4

Level 4

Level 2

Level 3

Level 4

Level 5

Level 2

VENTILATION
CONTROL SYSTEM
AP.12

Level 3

TANK ANNULUS
VENTILATION
SYSTEM
AP.12.2

Level 4

Annulus
Diff. Pressure
Inst. Subsystem
AP.12.2.1

Level 2

Level 3

Level 2

Level 3

Level 4

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4.4 Drawing Reference Tables

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EXISTING TANK FARM EQUIPMENT SYSTEM DRAWING REFERENCES INSTRUMENTS & CONTROL SYSTEMS				
REF NO.	SYSTEM NAME	DRAWING REFERENCES	NO. OF ECNs OUTSTANDING	PO RD REFERENCE
AP.11	LEAK CONTROL SYSTEM	H-2-90487	0	1. 3.2.1.1.2.4
AP.11.1	LEAK DET. PIT/SUMP INST.	H-2-90487, H-2-90444	0	
AP.11.1.1	Gamma Radiation Monitoring Subsystem	H-2-90487, H-2-90444	0	1. 3.2.1.1.1.17
AP.11.1.1.1	Gamma Probe Well Structure	H-2-90444	0	
AP.11.1.1.2	Gamma Probe & Well Cable			
AP.11.1.1.3	Field Signal Cable	H-2-90470	1	
AP.11.1.1.4	reserved			
AP.11.1.1.5	Count Rate Meters/ Alarm Comparators.	H-2-90496	2	
AP.11.1.2	Weight Factor & Specific Gravity Monitoring Subsystem	H-2-90487	0	1. 3.2.1.1.1.17
AP.11.1.2.1	Sample Tubes (Leak Det. Ptl)	H-2-90566	0	
AP.11.1.2.2	Weight Factor & Specific Gravity Pressure Sensors	H-2-90487, H-2-90493	1	
AP.11.1.2.3	Transmitter Mux. Cabinet (farm)	H-2-90493	1	
AP.11.1.2.4	Analog Rack (241-AP-271)	H-2-90503	0	
AP.11.1.2.5	Alarm Indication	H-2-90503, H-2-90496	2	
AP.11.1.3	Liquid Presence Sensor and Buried wiring	N/A		1. 3.2.1.1.1.17
AP.11.1.4	Liquid Temperature Sensor	H-2-90487	0	1. 3.2.1.1.1.17
AP.11.2	ANNULUS LEAK INSTRUMENTATION	H-2-90487, H-2-90488	0	1. Secondary Containment Leak Detection
AP.11.2.1	Annulus CAM Radiation Monitoring Subsystem	H-2-90488	0	1. 3.2.1.1.1.17
AP.11.2.1.1	Air Sampler Probe/ Tubing/ etc	H-2-92976	2	
AP.11.2.1.2	Radiation Analyzer	H-2-92976	2	

EXISTING TANK FARM EQUIPMENT SYSTEM DRAWING REFERENCES INSTRUMENTS & CONTROL SYSTEMS				
REF NO.	SYSTEM NAME	DRAWING REFERENCES	NO. OF ECNs OUTSTANDING	POED REFERENCE
AP.11.2.1.3	Cabinet (Vent. Pft)	H-2-90476	2	
AP.11.2.1.4	1-Pen recorder & Alarms (241-AP-271)	H-2-90496	2	
AP.11.2.1.5	Signal Wiring/ Conduit	H-2-90470	1	
AP.11.2.2	Annulus Liquid Presence Sensor (Flake Box & Manual Tape Conductivity Probe)	H-2-90490	0	1. 3.2.1.1.1.17
AP.11.2.3	Annulus Pump Pt Liquid Presence Sensor			
AP.11.3	PIPELINE LEAK INSTRUMENTATION	H-2-90444, H-2-90476	0	1. 3.2.1.1.2.7 2. Secondary Containment Leak Detection
AP.11.3.1	C.O.B. Liquid Presence Sensor	H-2-90488	0	1. 3.2.1.1.2.7
AP.11.3.2	Pipeline Pressure Switch Sensor	N/A		1. 3.2.1.1.2.10 2. 3.2.1.3.4
AP.11.3.3	Transfer Pits; Liquid Presence Sensor	H-2-90488	0	1. 3.2.1.1.2.7
AP.11.3.3.1	Pft Liquid Presence Sensor	H-2-34956	0	
AP.11.3.3.2	Pft Pressure Switch Sensor	N/A		
AP.11.3.3.3	Signal Wiring/Conduit/TBX	H-2-90470	1	
AP.11.3.4	Signal Wiring/ Conduit/ Terminal Boxes	H-2-90470	1	
AP.11.3.5	Service Pft Instrument (LDE only)			
AP.11.4	PUMP PERMISSIVE INSTRUMENTATION (Master Pump shutdown)	H-2-90476	0	1. 3.2.1.1.2.9 2. 3.2.1.1.2.10 3. 3.2.1.3.10
AP.11.4.1	241-AP-271 Master Pump Shutdown Relay Panel	H-2-90476	0	1. 3.2.1.1.2.9 2. 3.2.1.1.2.10 3. 3.2.1.3.10
AP.11.4.2	MPS Pushbutton Control Panel			
AP.11.4.3	Signal Wiring/Conduit/TBX	H-2-90470	1	

EXISTING TANK FARM EQUIPMENT SYSTEM DRAWING REFERENCES INSTRUMENTS & CONTROL SYSTEMS				
REF NO.	SYSTEM NAME	DRAWING REFERENCES	NO. OF ECNs OUTSTANDING	PDRD REFERENCE
AP.11.4.4	[242-A Relay Panel]			
AP.11.5	LOCAL ALARM ANNUNCIATION & ALARM PANELS	H-2-90496	2	1. 3.2.1.1.2.2 2. 3.2.1.1.2.3 3. 3.2.1.1.2.4 4. 3.2.1.1.2.5 5. 3.2.1.1.2.13 6. 3.2.1.1.3
AP.11.5.1	Alarm Panel (241-AP-271)	H-2-90496	2	
AP.11.5.2	Tank Farm Alarm Panels	H-2-90496	2	
AP.11.5.3	CASS Alarm Panel Interface	H-2-71550	0	
AP.11.6	REMOTE ALARM SIGNALING (GAMEWELL LOOP)	H-2-71804, H-2-71805	0	3.2.1.1.3
AP.11.7	TANK WASTE HIGH LEVEL ALARM SUBSYSTEM	H-2-90487, H-2-90489	0	
AP.11.7.1	Waste Liquid High Level Probe	H-2-90487, H-2-90489	0	
AP.11.7.2	Tank Farm Alarm Panel (Current Sensitive Relays)	H-2-90476	0	
AP.11.7.3	Wiring/Conduit/TBX	H-2-90470	1	
AP.12	VENTILATION CONTROL SYSTEM	H-2-90514	0	
AP.12.1	TANK PRIMARY VENTILATION SYSTEM	H-2-90514	0	
AP.12.1.1	Tank Diff. Pressure Inst. Subsystem	H-2-90487	0	1. 3.2.1.1.1.33 2. 3.2.1.1.1.34 3. 3.2.1.1.1.35
AP.12.1.1.1	Tank Riser Tubing to Pressure Sensor/Transmitter	H-2-90553	0	
AP.12.1.1.2	Pressure Sensor/Transmitter	H-2-90491	1	
AP.12.1.1.3	Transmitter/Mux Cabinet (farm)	H-2-90491, H-2-90493	2	
AP.12.1.1.4	Analog rack (241-AP-271)	H-2-90503	0	

EXISTING TANK FARM EQUIPMENT SYSTEM DRAWING REFERENCES INSTRUMENTS & CONTROL SYSTEMS				
REF NO.	SYSTEM NAME	DRAWING REFERENCES	NO. OF ECNs OUTSTANDING	PRD REFERENCE
AP.12.1.1.5	<i>Pressure Recorder (241-AP-271)</i>	H-2-90496	2	
AP.12.1.2	HEPA Filter Diff. Pressure Instr.	H-2-90514	0	
AP.12.1.3	Temperature Instrumentation	H-2-90514	0	1. 3.2.1.1.1.4.1
AP.12.1.4	Heater Control Subsystem	H-2-90514, H-2-90476	0	
AP.12.1.5	Fan Motor Control Subsystem	H-2-90514, H-2-90476	0	
AP.12.1.6	Damper Control Subsystem	N/A - MANUAL		
AP.12.1.7	<i>Moisture Monitoring Subsystem</i>			3.2.1.1.1.4.2
AP.12.1.8	Regulated Stack Monitoring System	H-2-90488, H-2-98970	0	1. 3.2.1.1.1.4.2
AP.12.1.8.1	<i>Tubing from Stack to CAMs</i>	H-2-90509	0	
AP.12.1.8.2	<i>CAMs (Radiation Analyzers)</i>	H-2-90509	0	
AP.12.1.8.3	<i>CAM Cabinets</i>	H-2-90509	0	
AP.12.1.8.4	<i>Vacuum Pumps</i>	H-2-90509	0	
AP.12.1.8.5	<i>Pen Recorder (242-AP-271)</i>			
AP.12.2	TANK ANNULUS VENTILATION SYSTEM	H-2-90514	0	
AP.12.2.1	Annulus Diff. Pressure Inst. Subsystem	H-2-90514	0	3.2.1.2.3.1
AP.13	TRANSFER LINE CONTROL SYSTEM			1. 3.2.1.1.2.5 2. 3.2.1.1.2.8
AP.13.1	PUMP CONTROL SUBSYSTEM	H-2-90476	1	1. 3.2.1.1.2.9
AP.13.2	VALVE POSITION INSTRUMENTATION/ INDICATION	H-2-90488	0	1. 3.2.1.1.2.10
AP.13.3	VALVE CONTROL SYSTEM	H-2-90488	0	1. 3.2.1.1.2.10
AP.13.4	PRESSURE SWITCH INSTRUMENTATION (Flow Indication)	H-2-90488	0	1. 3.2.1.1.2.9

EXISTING TANK FARM EQUIPMENT SYSTEM DRAWING REFERENCES INSTRUMENTS & CONTROL SYSTEMS				
REF NO.	SYSTEM NAME	DRAWING REFERENCES	NO. OF ECNs OUTSTANDING	PDRD REFERENCE
AP.13.5	WASTE FLOW MONITORING INSTRUMENTATION	N/A		1. 3.2.1.1.2.1.1
AP.13.5.1	Service Pit Instrument Subsystems	H-2-90513, H-2-90488	0	
AP.13.5.1.1	Flow Monitor & Totalizer	H-2-90488	0	
AP.13.5.1.2	Radiation (Gamma) Monitor	H-2-90513, H-2-90488	0	
AP.13.5.1.3	Pipeline Pressure Sensor	H-2-90488	0	
AP.14	TANK CONTENTS MONITORING SYSTEM	H-2-90487	0	1. 3.2.1.1.2.6
AP.14.1	TEMPERATURE/VAPOR INSTRUMENTATION	H-2-90487	0	1. 3.2.1.1.1.9 2. 3.2.1.1.1.25 3. 3.2.1.2.1.1.1
AP.14.1.1	Thermocouple Probes	H-2-90487, H-2-90492	0	
AP.14.1.2	Multifunction Instrument Tree	N/A		
AP.14.1.3	Temperature Vapor Probe			
AP.14.2	reserved for SUMS			
AP.14.3	CHEMICAL COMPOSITION MONITORING INSTRUMENTATION			
AP.14.3.1	reserved			
AP.14.4	TANK LIQUID SURFACE LEVEL INSTRUMENTATION	H-2-90487	0	1. 3.2.1.1.1.5 2. 3.2.1.1.1.13 3. 3.2.1.1.2.12
AP.14.4.1	FIC Riser Extension	H-2-36382	24	
AP.14.4.2	FIC Level Sensor	H-2-36382	24	
AP.14.4.4	FIC Buried Signal Cable	H-2-36378	3	
AP.14.4.4	Terminal Boxes	H-2-36378, H-2-36382	27	
AP.14.4.5	CASS Interface	H-2-90489, H-2-90507, H-2-71801, H-2-71802, H-2-71803	6	
AP.14.5	SLUDGE WEIGHT (LEVEL) MONITORING	H-2-90490	0	

EXISTING TANK FARM EQUIPMENT SYSTEM DRAWING REFERENCES INSTRUMENTS & CONTROL SYSTEMS				
REF NO.	SYSTEM NAME	DRAWING REFERENCES	NO. OF ECNs OUTSTANDING	PORD REFERENCE
AP.15	TANK CONTENTS MIXING SYSTEMS			
AP.15.1	AIR LIFT CIRCULATOR CONTROL SYSTEM	N/A		
AP.15.1.1	Diff. Pressure Sensors	N/A		
AP.15.1.2	Local Alarm Indication	N/A		
AP.15.2	MIXER PUMP CONTROL SYSTEM			
AP.16	SCC STATUS/MONITORING SYSTEM			1. 3.2.1.1.2.1 2. 3.2.1.1.2.3
AP.16.1	AC POWER SUPPLY STATUS INST.	H-2-90474	0	
AP.16.2	AIR SUPPLY STATUS INST.			
AP.16.3	WATER SUPPLY STATUS INST.			
AP.16.4	TANK CONCRETE STRUCTURE TEMPERATURE INST.	H-2-90487	0	1. 3.2.1.1.1.29 2. 3.2.1.2.1.1.2
AP.16.4.1	Data Loggers (241,AP-271)	H-2-77621	0	
AP.16.4.2	Manual Readout Control Panel	H-2-90494	0	
AP.16.4.3	Signal Wiring/Conduit/TBX	H-2-90470	1	
AP.16.5	HEAT TRACE SYSTEM STATUS INST.			
AP.16.6	CATHODIC PROTECTION SYSTEM STATUS INST.	H-2-94077	0	
AP.17	HEAT TRACE CONTROL SYSTEM	H-2-90472	0	1. 3.2.1.3
AP.17.1	TEMPERATURE MONITORING SENSORS	H-2-90472	0	
AP.17.2	TEMP. CONTROLLER SUBSYSTEM	H-2-90472	0	
AP.17.3	OVER TEMP. CONTROLLER SUBSYSTEM	H-2-90472	0	
AP.17.4	HEATER CONTACTORS - OTHER WIRING	H-2-90472	0	
AP.17.5	PIPELINE HEAT TRACE TAPE HEATERS	H-2-90472	0	

EXISTING TANK FARM EQUIPMENT SYSTEM DRAWING REFERENCES INSTRUMENTS & CONTROL SYSTEMS				
REF NO.	SYSTEM NAME	DRAWING REFERENCES	NO. OF ECNs OUTSTANDING	PDRD REFERENCE
AP IB	CATHODIC PROTECTION CONTROL SYSTEM	H-2-94077	0	1. 3.2.1.3.5 2. Testing Requirements
AP IB.1	POWER CONTROLLER	H-2-94085	0	
AP IB.2	WIRING/CONDUIT/TBX	H-2-94077 thru H-2-94084	0	

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4.5 Special Testing

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4.6 Field Assessment Questionnaire

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EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT QUESTIONNAIRE INSTRUMENTS & CONTROL SYSTEMS			
SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS	
AP.11	LEAK CONTROL SYSTEM		
AP.11.1	LEAK DET. PIT/SUMP INST.		
AP.11.1.1	Gamma Radiation Monitoring Subsystem		
AP.11.1.1.1	Gamma Probe Well Structure	Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.11.1.1.2	Gamma Probe & Well Cable	Inspect instrument cables where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Determine maintenance repair frequency for equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.11.1.1.3	Field Signal Cable	Inspect instrument cables where accessible. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.11.1.1.4	reserved		
AP.11.1.1.5	Count Rate Meters/Alarm Comparators.	Inspect instrument cables where accessible. Inspect wiring where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Determine maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"All cables and wiring that could be accessed is in good condition". "Equipment cabinets and terminal boxes are in good condition. Some dirt is in the cabinets out in the farm. This is the result of cabinet latches not being secured after field work is completed". "Estimated age of equipment is ten years". "Maintenance and repair frequency is low". "Calibration is performed in the shop at six month intervals". "No recurrent problems".
AP.11.1.2	Weight Factor & Specific Gravity Monitoring Subsystem		

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT QUESTIONNAIRE INSTRUMENTS & CONTROL SYSTEMS			
	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AP.11	LEAK CONTROL SYSTEM		
AP.11.1	LEAK DET. PIT/SUMP INST.		
AP.11.1.1	Gamma Radiation Monitoring Subsystem		
AP.11.1.1.1	<i>Gamma Probe Well Structure</i>	Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.11.1.1.2	<i>Gamma Probe & Well Cable</i>	Inspect instrument cables where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.11.1.1.3	<i>Field Signal Cable</i>	Inspect instrument cables where accessible. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.11.1.1.4	<i>reserved</i>		
AP.11.1.2.1	<i>Sample Tubes (Leak Det. Pit)</i>	Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Unable to arrange access during the field inspection".
AP.11.1.2.2	<i>Weight Factor & Specific Gravity Pressure Sensors</i>	Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Determine maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Instrument wire and cables are in good condition". "Pneumatic tubing is in good condition". "Wire terminations are in good condition". "Transmitters are manufactured by Bailey model BC-2421531 series 10 with a maximum D.P. range of 150 in. W.G. which sends a 4-20 milliamp signal to a Tracor Westronics process multiplexer model MX 60. A visual inspection did not reveal any discrepancies". "Calibration frequency and methods are unknown". "The physical appearance of the equipment is assessed as good".

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT QUESTIONNAIRE INSTRUMENTS & CONTROL SYSTEMS			
	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AP.11	LEAK CONTROL SYSTEM		
AP.11.1	LEAK DET. PIT/SUMP INST.		
AP.11.1.1	Gamma Radiation Monitoring Subsystem		
AP.11.1.1.1	<i>Gamma Probe Well Structure</i>	Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.11.1.1.2	<i>Gamma Probe & Well Cable</i>	Inspect instrument cables where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.11.1.1.3	<i>Field Signal Cable</i>	Inspect instrument cables where accessible. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.11.1.1.4	<i>reserved</i>		
AP.11.1.2.3	<i>Transmitter Mux. Cabinet (farm)</i>	Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"The cabinet is in good condition although some dirt has accumulated in the bottom of the cabinet. This is caused by cabinet latches not being secured after field work is performed".
AP.11.1.2.4	<i>Analog Rack (241-AP-271)</i>	Inspect instrument cables where accessible. Inspect wiring where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"The signal is converted at the MUX cabinet via P to I xmitters and sent to a Tracor Westronics process multiplexer which is also located in the MUX cabinet. The analog rack in 271 is in good condition indicating good wire terminations and wire feeds".

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT QUESTIONNAIRE INSTRUMENTS & CONTROL SYSTEMS			
	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AP.11	LEAK CONTROL SYSTEM		
AP.11.1	LEAK DET. PIT/SUMP INST.		
AP.11.1.1	Gamma Radiation Monitoring Subsystem		
AP.11.1.1.1	Gamma Probe Well Structure	Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.11.1.1.2	Gamma Probe & Well Cable	Inspect instrument cables where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Determine maintenance repair frequency for equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.11.1.1.3	Field Signal Cable	Inspect instrument cables where accessible. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.11.1.1.4	reserved		
AP.11.1.2.5	Alarm Indication	Inspect instrument cables where accessible. Inspect wiring where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"No local alarm panel was noted in the 271 building".
AP.11.1.3	Liquid Presence Sensor and Buried wiring		"Unable to arrange access during the field inspection".
AP.11.1.4	Liquid Temperature Sensor		"Unable to arrange access during the field inspection".
AP.11.2	ANNULUS LEAK INSTRUMENTATION		

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT QUESTIONNAIRE INSTRUMENTS & CONTROL SYSTEMS			
SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS	
AP.11	LEAK CONTROL SYSTEM		
AP.11.1	LEAK DET. PIT/SUMP INST.		
AP.11.1.1	Gamma Radiation Monitoring Subsystem		
AP.11.1.1.1	Gamma Probe Well Structure	"Access could not be arranged at the time of the field inspection".	
AP.11.1.1.2	Gamma Probe & Well Cable	"Access could not be arranged at the time of the field inspection".	
AP.11.1.1.3	Field Signal Cable	"Access could not be arranged at the time of the field inspection".	
AP.11.1.1.4	reserved		
AP.11.2.1	Annulus CAM Radiation Monitoring Subsystem		
AP.11.2.1.1	Air Sampler Probe/ Tubing/ etc	"Air sampling probe could not be accessed. Air sampling tubing is in good condition".	

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT QUESTIONNAIRE INSTRUMENTS & CONTROL SYSTEMS			
	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AP.11	LEAK CONTROL SYSTEM		
AP.11.1	LEAK DET. PIT/SUMP INST.		
AP.11.1.1	Gamma Radiation Monitoring Subsystem		
AP.11.1.1.1	<i>Gamma Probe Well Structure</i>	Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.11.1.1.2	<i>Gamma Probe & Well Cable</i>	Inspect instrument cables where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.11.1.1.3	<i>Field Signal Cable</i>	Inspect instrument cables where accessible. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.11.1.1.4	<i>reserved</i>		
AP.11.2.1.2	<i>Radiation Analyzer</i>	Inspect instrument cables where accessible. Inspect wiring where accessible. Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"No deficiencies were noted for the Eberline CAMs. Cabinets are equipped with pull out shelves for ease of maintenance and access".

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT QUESTIONNAIRE INSTRUMENTS & CONTROL SYSTEMS			
	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AP-11	LEAK CONTROL SYSTEM		
AP-11.1	LEAK DET. PIT/SUMP INST.		
AP-11.1.1	Gamma Radiation Monitoring Subsystem		
AP-11.1.1.1	<i>Gamma Probe Well Structure</i>	Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP-11.1.1.2	<i>Gamma Probe & Well Cable</i>	Inspect instrument cables where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP-11.1.1.3	<i>Field Signal Cable</i>	Inspect instrument cables where accessible. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP-11.1.1.4	<i>reserved</i>		
AP-11.2.1.3	<i>Cabinet (Vent. Pit)</i>	Inspect instrument cables where accessible. Inspect wiring where accessible. Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Cabinets are in good condition with maintenance access improved with the pull out shelf where the CAM is mounted".

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT QUESTIONNAIRE INSTRUMENTS & CONTROL SYSTEMS			
	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AP.11	LEAK CONTROL SYSTEM		
AP.11.1	LEAK DET. PIT/SUMP INST.		
AP.11.1.1	Gamma Radiation Monitoring Subsystem		
AP.11.1.1.1	<i>Gamma Probe Well Structure</i>	Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.11.1.1.2	<i>Gamma Probe & Well Cable</i>	Inspect instrument cables where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.11.1.1.3	<i>Field Signal Cable</i>	Inspect instrument cables where accessible. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.11.1.1.4	<i>reserved</i>		
AP.11.2.1.4	<i>1-Pen recorder & Alarms (241-AP-271)</i>	Inspect instrument cables where accessible. Inspect wiring where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Cables and wiring is in good condition where accessible" "Cabinets and housings are in good condition" "Estimated age of equipment is ten years" "Calibration is performed annually in the field at one hour per instrument" "Continual repair action is expected to keep equipment within calibration tolerances"

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT QUESTIONNAIRE INSTRUMENTS & CONTROL SYSTEMS			
	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AP.11	LEAK CONTROL SYSTEM		
AP.11.1	LEAK DET. PIT/SUMP INST.		
AP.11.1.1	Gamma Radiation Monitoring Subsystem		
AP.11.1.1.1	<i>Gamma Probe Well Structure</i>	Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.11.1.1.2	<i>Gamma Probe & Well Cable</i>	Inspect instrument cables where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Determine maintenance repair frequency for equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.11.1.1.3	<i>Field Signal Cable</i>	Inspect instrument cables where accessible. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.11.1.1.4	<i>reserved</i>		
AP.11.2.1.5	<i>Signal Wiring/ Conduit</i>	Inspect instrument cables where accessible. Inspect wiring where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Conduit and signal wiring is in good condition where accessible".
AP.11.2.2	Annulus Liquid Presence Sensor (Flake Box & Manual Tape Conductivity Probe)		"Cables that could be viewed at the TBX are in good condition". "Estimated age of equipment is ten years". "O-ring seals require replacement frequently". "A functional test is performed monthly". "Requires continuous supply of purge air".
AP.11.2.3	Annulus Pump Pit Liquid Presence Sensor		"See comment at AP.1.2.3

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT QUESTIONNAIRE INSTRUMENTS & CONTROL SYSTEMS				FINDINGS/COMMENTS
	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION		
AP.11	LEAK CONTROL SYSTEM			
AP.11.1	LEAK DET. PIT/SUMP INST.			
AP.11.1.1	Gamma Radiation Monitoring Subsystem			
AP.11.1.1.1	<i>Gamma Probe Well Structure</i>	Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.		"Access could not be arranged at the time of the field inspection".
AP.11.1.1.2	<i>Gamma Probe & Well Cable</i>	Inspect instrument cables where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.		"Access could not be arranged at the time of the field inspection".
AP.11.1.1.3	<i>Field Signal Cable</i>	Inspect instrument cables where accessible. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.		"Access could not be arranged at the time of the field inspection".
AP.11.1.1.4	<i>reserved</i>			
AP.11.3	PIPELINE LEAK INSTRUMENTATION			
AP.11.3.1	C.O.B. Liquid Presence Sensor			"Unable to arrange access during the field inspection".
AP.11.3.2	Pipeline Pressure Switch Sensor			"Unable to arrange access during the field inspection".
AP.11.3.3	Transfer Pits; Liquid Presence Sensor			"Unable to arrange access during the field inspection".

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT QUESTIONNAIRE INSTRUMENTS & CONTROL SYSTEMS			
	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AP-11	LEAK CONTROL SYSTEM		
AP-11.1	LEAK DET. PIT/SUMP INST.		
AP-11.1.1	Gamma Radiation Monitoring Subsystem		
AP-11.1.1.1	<i>Gamma Probe Well Structure</i>	Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP-11.1.1.2	<i>Gamma Probe & Well Cable</i>	Inspect instrument cables where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP-11.1.1.3	<i>Field Signal Cable</i>	Inspect instrument cables where accessible. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP-11.1.1.4	<i>reserved</i>		
AP-11.3.3.1	<i>Pit Liquid Presence Sensor</i>	Inspect wiring where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Unable to arrange access during the field inspection".

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT QUESTIONNAIRE INSTRUMENTS & CONTROL SYSTEMS			
	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AP.11	LEAK CONTROL SYSTEM		
AP.11.1	LEAK DET. PIT/SUMP INST.		
AP.11.1.1	Gamma Radiation Monitoring Subsystem		
AP.11.1.1.1	Gamma Probe Well Structure	Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.11.1.1.2	Gamma Probe & Well Cable	Inspect instrument cables where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.11.1.1.3	Field Signal Cable	Inspect instrument cables where accessible. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.11.1.1.4	reserved		
AP.11.3.3.2	Pit Pressure Switch Sensor	Inspect wiring where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Unable to arrange access during the field inspection".
AP.11.3.3.3	Signal Wiring/Conduit/TBX	Inspect wiring where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT QUESTIONNAIRE INSTRUMENTS & CONTROL SYSTEMS			
	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AP-11	LEAK CONTROL SYSTEM		
AP-11.1	LEAK DET. PIT/SUMP INST.		
AP-11.1.1	Gamma Radiation Monitoring Subsystem		
AP-11.1.1.1	<i>Gamma Probe Well Structure</i>	Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP-11.1.1.2	<i>Gamma Probe & Well Cable</i>	Inspect instrument cables where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP-11.1.1.3	<i>Field Signal Cable</i>	Inspect instrument cables where accessible. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP-11.1.1.4	<i>reserved</i>		
AP-11.3.4	Signal Wiring/ Conduit/ Terminal Boxes		"TBX and signal wire that was accessed is in good condition".
AP-11.3.5	Service Pit Instrument (LDE only)		"Unable to arrange access during the field inspection".
AP-11.4	PUMP PERMISSIVE INSTRUMENTATION (Master Pump shutdown)		
AP-11.4.1	241-AP-271 Master Pump Shutdown Relay Panel		"Relay panel wiring and terminations are in good condition".
AP-11.4.2	MPS Pushbutton Control Panel		"Control panel is in good condition".
AP-11.4.3	Signal Wiring/Conduit/TBX		"All TBXs and signal wiring that was accessed is in good condition".

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT QUESTIONNAIRE INSTRUMENTS & CONTROL SYSTEMS				FINDINGS/COMMENTS
	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION		
AP.11	LEAK CONTROL SYSTEM			
AP.11.1	LEAK DET. PIT/SUMP INST.			
AP.11.1.1	Gamma Radiation Monitoring Subsystem			
AP.11.1.1.1	<i>Gamma Probe Well Structure</i>	Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.		"Access could not be arranged at the time of the field inspection".
AP.11.1.1.2	<i>Gamma Probe & Well Cable</i>	Inspect instrument cables where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.		"Access could not be arranged at the time of the field inspection".
AP.11.1.1.3	<i>Field Signal Cable</i>	Inspect instrument cables where accessible. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.		"Access could not be arranged at the time of the field inspection".
AP.11.1.1.4	<i>reserved</i>			
AP.11.4.4	[242-A Relay Panel]			"Evaporator equipment was not included in the field assessments".
AP.11.5	LOCAL ALARM ANNUNCIATION & ALARM PANELS			
AP.11.5.1	Alarm Panel (241-AP-271)			"The local alarm panels in 271 building are in good condition".
AP.11.5.2	Tank Farm Alarm Panels			"No local alarm panel were accessed within the farm".
AP.11.5.3	CASS Alarm Panel Interface			"CASS interface was not accessed during the field inspection".
AP.11.6	REMOTE ALARM SIGNALING (GAMEWELL LOOP)			"Unable to arrange access during the field inspection".

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT QUESTIONNAIRE INSTRUMENTS & CONTROL SYSTEMS			
	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AP.11	LEAK CONTROL SYSTEM		
AP.11.1	LEAK DET. PIT/SUMP INST.		
AP.11.1.1	Gamma Radiation Monitoring Subsystem		
AP.11.1.1.1	<i>Gamma Probe Well Structure</i>	Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.11.1.1.2	<i>Gamma Probe & Well Cable</i>	Inspect instrument cables where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.11.1.1.3	<i>Field Signal Cable</i>	Inspect instrument cables where accessible. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.11.1.1.4	<i>reserved</i>		
AP.11.7	TANK WASTE HIGH LEVEL ALARM SUBSYSTEM		
AP.11.7.1	Waste Liquid High Level Probe		"Unable to arrange access during the field inspection".
AP.11.7.2	Tank Farm Alarm Panel (Current Sensitive Relays)		"All relay panels accessed in the 271 building are in good condition. No calibration is performed on current sensitive relays within farm. Functional tests are performed by the electricians".
AP.11.7.3	Wiring/Conduit/TBX		"All TBXs and signal wiring that was accessed is in good condition".
AP.12	VENTILATION CONTROL SYSTEM		
AP.12.1	TANK PRIMARY VENTILATION SYSTEM		

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT QUESTIONNAIRE INSTRUMENTS & CONTROL SYSTEMS			
	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AP-II	LEAK CONTROL SYSTEM		
AP-II.1	LEAK DET. PIT/SUMP INST.		
AP-II.1.1	Gamma Radiation Monitoring Subsystem		
AP-II.1.1.1	<i>Gamma Probe Well Structure</i>	Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP-II.1.1.2	<i>Gamma Probe & Well Cable</i>	Inspect instrument cables where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP-II.1.1.3	<i>Field Signal Cable</i>	Inspect instrument cables where accessible. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP-II.1.1.4	<i>reserved</i>		
AP-II.2.1.1	Tank Diff. Pressure Inst. Subsystem		
AP-II.2.1.1.1	<i>Tank Riser Tubing to Pressure Sensor/Transmitter</i>	Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Unable to arrange access during the field inspection".

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT QUESTIONNAIRE INSTRUMENTS & CONTROL SYSTEMS			
	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AP.1.1	LEAK CONTROL SYSTEM		
AP.1.1.1	LEAK DET. PIT/SUMP INST.		
AP.1.1.1.1	Gamma Radiation Monitoring Subsystem		
AP.1.1.1.1.1	<i>Gamma Probe Well Structure</i>	Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.1.1.1.1.2	<i>Gamma Probe & Well Cable</i>	Inspect instrument cables where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Determine maintenance repair frequency for equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.1.1.1.1.3	<i>Field Signal Cable</i>	Inspect instrument cables where accessible. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.1.1.1.1.4	<i>reserved</i>		
AP.1.2.1.1.2	<i>Pressure Sensor/Transmitter</i>	Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Determine maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Unable to arrange access during the field inspection".

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT QUESTIONNAIRE INSTRUMENTS & CONTROL SYSTEMS			
	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AP.11	LEAK CONTROL SYSTEM		
AP.11.1	LEAK DET. PIT/SUMP INST.		
AP.11.1.1	Gamma Radiation Monitoring Subsystem		
AP.11.1.1.1	<i>Gamma Probe Well Structure</i>	Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.11.1.1.2	<i>Gamma Probe & Well Cable</i>	Inspect instrument cables where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.11.1.1.3	<i>Field Signal Cable</i>	Inspect instrument cables where accessible. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.11.1.1.4	<i>reserved</i>		
AP.12.1.1.3	<i>Transmitter/Mux Cabinet (farm)</i>	Inspect instrument cables where accessible. Inspect wiring where accessible. Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"All wiring and terminations are in good condition". "Tubing is in good condition". "Estimated age of equipment is ten years". "Repair frequency is low". "Field calibrated at one hour per instrument". "No known repair problems".

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT QUESTIONNAIRE INSTRUMENTS & CONTROL SYSTEMS			
	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AP-11	LEAK CONTROL SYSTEM		
AP-11.1	LEAK DET. PIT/SUMP INST.		
AP-11.1.1	Gamma Radiation Monitoring Subsystem		
AP-11.1.1.1	<i>Gamma Probe Well Structure</i>	Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP-11.1.1.2	<i>Gamma Probe & Well Cable</i>	Inspect instrument cables where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP-11.1.1.3	<i>Field Signal Cable</i>	Inspect instrument cables where accessible. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP-11.1.1.4	<i>reserved</i>		
AP-12.1.1.4	<i>Analog rack (24 I-AP-271)</i>	Inspect instrument cables where accessible. Inspect wiring where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT QUESTIONNAIRE INSTRUMENTS & CONTROL SYSTEMS			
	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AP.11	LEAK CONTROL SYSTEM		
AP.11.1	LEAK DET. PIT/SUMP INST.		
AP.11.1.1	Gamma Radiation Monitoring Subsystem		
AP.11.1.1.1	<i>Gamma Probe Well Structure</i>	Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.11.1.1.2	<i>Gamma Probe & Well Cable</i>	Inspect instrument cables where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.11.1.1.3	<i>Field Signal Cable</i>	Inspect instrument cables where accessible. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.11.1.1.4	<i>reserved</i>		
AP.12.1.1.5	<i>Pressure Recorder (241-AP-271)</i>	Inspect instrument cables where accessible. Inspect wiring where accessible. Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Cables and wiring is in good condition where accessible" "Cabinets and housings are in good condition" "Estimated age of equipment is ten years" "Calibration is performed annually in the field at one hour per instrument" "Continual repair action is expected to keep equipment within calibration tolerances".
AP.12.1.2	HEPA Filter Diff. Pressure Instr.		"Tubing is in good condition" "Estimated age of equipment is ten years" "Calibration is performed annually in the field at 30 minutes per instrument" "No known recurrent problems"

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT QUESTIONNAIRE INSTRUMENTS & CONTROL SYSTEMS			
	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AP.11	LEAK CONTROL SYSTEM		
AP.11.1	LEAK DET. PIT/SUMP INST.		
AP.11.1.1	Gamma Radiation Monitoring Subsystem		
AP.11.1.1.1	<i>Gamma Probe Well Structure</i>	Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.11.1.1.2	<i>Gamma Probe & Well Cable</i>	Inspect instrument cables where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.11.1.1.3	<i>Field Signal Cable</i>	Inspect instrument cables where accessible. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.11.1.1.4	<i>reserved</i>		
AP.12.1.3	Temperature Instrumentation		"Unable to arrange access during the field inspection".
AP.12.1.4	Heater Control Subsystem		"Wires are in good condition". "Estimated age of equipment is ten years". "Electricians perform a functional test". "No known recurrent problems (AP farm has install solid state controllers manufactured by Chromalox)".
AP.12.1.5	Fan-Motor Control Subsystem		"No deficiencies were noted".
AP.12.1.6	Damper Control Subsystem		"Dampers were fully functional during the inspection and no deficiencies were noted".
AP.12.1.8	Regulated Stack Monitoring System (296-A-27)		

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT QUESTIONNAIRE INSTRUMENTS & CONTROL SYSTEMS			
SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS	
AP.11	LEAK CONTROL SYSTEM		
AP.11.1	LEAK DET. PIT/SUMP INST.		
AP.11.1.1	Gamma Radiation Monitoring Subsystem		
AP.11.1.1.1	<i>Gamma Probe Well Structure</i> Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".	
AP.11.1.1.2	<i>Gamma Probe & Well Cable</i> Inspect instrument cables where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".	
AP.11.1.1.3	<i>Field Signal Cable</i> Inspect instrument cables where accessible. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".	
AP.11.1.1.4	<i>reserved</i>		
AP.12.1.8.1	<i>Tubing from Stack to CAMs</i> Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Tubing is in good condition".	

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT QUESTIONNAIRE INSTRUMENTS & CONTROL SYSTEMS			
	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AP.11	LEAK CONTROL SYSTEM		
AP.11.1	LEAK DET. PIT/SUMP INST.		
AP.11.1.1	Gamma Radiation Monitoring Subsystem		
AP.11.1.1.1	<i>Gamma Probe Well Structure</i>	Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.11.1.1.2	<i>Gamma Probe & Well Cable</i>	Inspect instrument cables where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.11.1.1.3	<i>Field Signal Cable</i>	Inspect instrument cables where accessible. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.11.1.1.4	<i>reserved</i>		
AP.12.1.8.2	<i>CAMs (Radiation Analyzers)</i>	Inspect instrument cables where accessible. Inspect wiring where accessible. Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"No deficiencies were noted for the Eberline CAMs. Cabinets are equipped with pull out shelves for ease of maintenance and access".
AP.12.1.8.3	<i>CAM Cabinets</i>	Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Cabinets are in good condition with maintenance access improved with the pull out shelf where the CAM is mounted".

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT QUESTIONNAIRE INSTRUMENTS & CONTROL SYSTEMS			
	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AP.11	LEAK CONTROL SYSTEM		
AP.11.1	LEAK DET. PIT/SUMP INST.		
AP.11.1.1	Gamma Radiation Monitoring Subsystem		
AP.11.1.1.1	Gamma Probe Well Structure	Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.11.1.1.2	Gamma Probe & Well Cable	Inspect instrument cables where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Determine maintenance repair frequency for equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.11.1.1.3	Field Signal Cable	Inspect instrument cables where accessible. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.11.1.1.4	reserved		
AP.12.1.8.4	Vacuum Pumps	Inspect wiring where accessible. Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Determine maintenance repair frequency for equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Vacuum pumps are in good condition".

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT QUESTIONNAIRE INSTRUMENTS & CONTROL SYSTEMS			
	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AP.11	LEAK CONTROL SYSTEM		
AP.11.1	LEAK DET. PIT/SUMP INST.		
AP.11.1.1	Gamma Radiation Monitoring Subsystem		
AP.11.1.1.1	<i>Gamma Probe Well Structure</i>	Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.11.1.1.2	<i>Gamma Probe & Well Cable</i>	Inspect instrument cables where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.11.1.1.3	<i>Field Signal Cable</i>	Inspect instrument cables where accessible. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.11.1.1.4	<i>reserved</i>		
AP.12.1.1.8.5	<i>Pen Recorder (242-47)</i>	Inspect instrument cables where accessible. Inspect wiring where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Pen recorders that were located in the 271 building were in good condition. 242A evaporator was not included in the field assessments".
AP.12.2	TANK ANNULUS VENTILATION SYSTEM		

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT QUESTIONNAIRE INSTRUMENTS & CONTROL SYSTEMS			
	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AP.11	LEAK CONTROL SYSTEM		
AP.11.1	LEAK DET. PIT/SUMP INST.		
AP.11.1.1	Gamma Radiation Monitoring Subsystem		
AP.11.1.1.1	<i>Gamma Probe Well Structure</i>	Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.11.1.1.2	<i>Gamma Probe & Well Cable</i>	Inspect instrument cables where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.11.1.1.3	<i>Field Signal Cable</i>	Inspect instrument cables where accessible. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.11.1.1.4	<i>reserved</i>		
AP.12.2.1	Annulus Diff. Pressure Inst. Subsystem		"Instrument tubing is in good condition". "Estimated age of equipment is ten years". "Low repair frequency". "Calibration is performed annually in the field at one hour per instrument". "No known recurrent problems".
AP.13	TRANSFER LINE CONTROL SYSTEM		
AP.13.1	PUMP CONTROL SUBSYSTEM		"Unable to arrange access during the field inspection".
AP.13.2	VALVE POSITION INSTRUMENTATION/ INDICATION		"Valve position indication is at the cover blocks and is taken manually".
AP.13.3	VALVE CONTROL SYSTEM		"Valve position is obtained manually".

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT QUESTIONNAIRE INSTRUMENTS & CONTROL SYSTEMS			
	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AP.11	LEAK CONTROL SYSTEM		
AP.11.1	LEAK DET. PIT/SUMP INST.		
AP.11.1.1	Gamma Radiation Monitoring Subsystem		
AP.11.1.1.1	<i>Gamma Probe Well Structure</i>	Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.11.1.1.2	<i>Gamma Probe & Well Cable</i>	Inspect instrument cables where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.11.1.1.3	<i>Field Signal Cable</i>	Inspect instrument cables where accessible. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.11.1.1.4	<i>reserved</i>		
AP.13.4	PRESSURE SWITCH INSTRUMENTATION (Flow Indication)		"Unable to arrange access during the field inspection".
AP.13.5	WASTE FLOW MONITORING INSTRUMENTATION		"Unable to arrange access during the field inspection".
AP.13.5.1	Service Pt. Instrument Subsystems		"Unable to arrange access during the field inspection".

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT QUESTIONNAIRE INSTRUMENTS & CONTROL SYSTEMS			
	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AP.11	LEAK CONTROL SYSTEM		
AP.11.1	LEAK DET. PIT/SUMP INST.		
AP.11.1.1	Gamma Radiation Monitoring Subsystem		
AP.11.1.1.1	Gamma Probe Well Structure	Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.11.1.1.2	Gamma Probe & Well Cable	Inspect instrument cables where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.11.1.1.3	Field Signal Cable	Inspect instrument cables where accessible. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.11.1.1.4	reserved		
AP.13.5.1.1	Flow Monitor & Totalizer	Inspect wiring where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Unable to arrange access during the field inspection".

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT QUESTIONNAIRE INSTRUMENTS & CONTROL SYSTEMS			
	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AP.11	LEAK CONTROL SYSTEM		
AP.11.1	LEAK DET., PIT/SUMP INST.,		
AP.11.1.1	Gamma Radiation Monitoring Subsystem		
AP.11.1.1.1	<i>Gamma Probe Well Structure</i>	Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.11.1.1.2	<i>Gamma Probe & Well Cable</i>	Inspect instrument cables where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.11.1.1.3	<i>Field Signal Cable</i>	Inspect instrument cables where accessible. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.11.1.1.4	<i>reserved</i>		
AP.13.5.1.2	<i>Radiation (Gamma) Monitor</i>	Inspect instrument cables where accessible. Inspect wiring where accessible. Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Unable to arrange access during the field inspection".

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT QUESTIONNAIRE INSTRUMENTS & CONTROL SYSTEMS			
	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AP.11	LEAK CONTROL SYSTEM		
AP.11.1	LEAK DET. PIT/SUMP INST.		
AP.11.1.1	Gamma Radiation Monitoring Subsystem		
AP.11.1.1.1	Gamma Probe Well Structure	Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.11.1.1.2	Gamma Probe & Well Cable	Inspect instrument cables where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.11.1.1.3	Field Signal Cable	Inspect instrument cables where accessible. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.11.1.1.4	reserved		
AP.13.5.1.3	Pipeline Pressure Sensor	Inspect instrument cables where accessible. Inspect wiring where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Unable to arrange access during the field inspection".
AP.14	TANK CONTENTS MONITORING SYSTEM		
AP.14.1	TEMPERATURE/VAPOR INSTRUMENTATION		

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT QUESTIONNAIRE INSTRUMENTS & CONTROL SYSTEMS				FINDINGS/COMMENTS
SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION			
AP.11	LEAK CONTROL SYSTEM			
AP.11.1	LEAK DET. PIT/SUMP INST.			
AP.11.1.1	Gamma Radiation Monitoring Subsystem			
AP.11.1.1.1	<i>Gamma Probe Well Structure</i> Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.			"Access could not be arranged at the time of the field inspection".
AP.11.1.1.2	<i>Gamma Probe & Well Cable</i> Inspect instrument cables where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.			"Access could not be arranged at the time of the field inspection".
AP.11.1.1.3	<i>Field Signal Cable</i> Inspect instrument cables where accessible. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.			"Access could not be arranged at the time of the field inspection".
AP.11.1.1.4	<i>reserved</i>			
AP.14.1.1	Thermocouple Probes			"Unable to arrange access during the field inspection".
AP.14.1.2	Multifunction Instrument Tree			"Unable to arrange access during the field inspection".
AP.14.1.3	<i>Temperature Vapor Probe</i>			"Unable to arrange access during the field inspection".
AP.14.2	<i>reserved for SHMS</i>			"No SHMS monitoring is installed".
AP.14.3	CHEMICAL COMPOSITION MONITORING INSTRUMENTATION			
AP.14.3.1	<i>reserved</i>			
AP.14.4	TANK LIQUID SURFACE LEVEL INSTRUMENTATION			

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT QUESTIONNAIRE INSTRUMENTS & CONTROL SYSTEMS			
	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AP.11	LEAK CONTROL SYSTEM		
AP.11.1	LEAK DET. PIT/SUMP INST.		
AP.11.1.1	Gamma Radiation Monitoring Subsystem		
AP.11.1.1.1	<i>Gamma Probe Well Structure</i>	Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.11.1.1.2	<i>Gamma Probe & Well Cable</i>	Inspect instrument cables where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.11.1.1.3	<i>Field Signal Cable</i>	Inspect instrument cables where accessible. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.11.1.1.4	<i>reserved</i>		
AP.14.4.1	FIC Risar Extension		"The riser extension is in good condition with no indication of corrosion or physical damage".
AP.14.4.2	FIC Level Sensor		"Tubing is in good condition". "Estimated age of equipment is ten years". "Failure of the electronics and sensors are common". "Should the sensor fail to detect the liquid level the tape is usually damaged also".
AP.14.4.4	FIC Buried Signal Cable		"Unable to arrange access during the field inspection".
AP.14.4.4	Terminal Boxes		"All TBX's inspected were in good condition".
AP.14.4.5	CASS Interface		"Unable to arrange access during the field inspection".
AP.14.5	SLUDGE WEIGHT (LEVEL) MONITORING		"Unable to arrange access during the field inspection".

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT QUESTIONNAIRE INSTRUMENTS & CONTROL SYSTEMS			
SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS	
AP.II	LEAK CONTROL SYSTEM		
AP.II.1	LEAK DET. PIT/SUMP INST.		
AP.II.1.1	Gamma Radiation Monitoring Subsystem		
AP.II.1.1.1	Gamma Probe Well Structure Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".	
AP.II.1.1.2	Gamma Probe & Well Cable Inspect instrument cables where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".	
AP.II.1.1.3	Field Signal Cable Inspect instrument cables where accessible. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".	
AP.II.1.1.4	reserved		
AP.I5	TANK CONTENTS MIXING SYSTEMS		
AP.I5.1	AIR LIFT CIRCULATOR CONTROL SYSTEM	"Unable to arrange access during the field inspection".	
AP.I5.1.1	Diff. Pressure Sensors	"Unable to arrange access during the field inspection".	
AP.I5.1.2	Local Alarm Indication	"Local alarm panels are in good condition with no indications of physical damage".	
AP.I6	SCC STATUS/MONITORING SYSTEM		
AP.I6.1	AC POWER SUPPLY STATUS INST.	"AC power supplies are in good condition and no NEC violations were noted".	

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT QUESTIONNAIRE INSTRUMENTS & CONTROL SYSTEMS			
	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AP.11	LEAK CONTROL SYSTEM		
AP.11.1	LEAK DET. PIT/SUMP INST.		
AP.11.1.1	Gamma Radiation Monitoring Subsystem		
AP.11.1.1.1	Gamma Probe Well Structure	Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.11.1.1.2	Gamma Probe & Well Cable	Inspect instrument cables where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.11.1.1.3	Field Signal Cable	Inspect instrument cables where accessible. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.11.1.1.4	reserved		
AP.16.2	AIR SUPPLY STATUS INST.		"The air compressor and it's associated controls and air lines are in good condition. Air quality is not monitored".
AP.16.3	WATER SUPPLY STATUS INST.		"Water supply system was not inspected".
AP.16.4	TANK CONCRETE STRUCTURE TEMPERATURE INST.		"Temperature display instruments include two display panels manufactured by Tracor Westronics model DDS7800. No physical damage was noted and the display panels appeared to be in good condition".
AP.16.4.1	Data Loggers (241-AP-271)		
AP.16.4.2	Manual Readout Control Panel		
AP.16.4.3	Signal Wiring/Conduit/TBX		"All signal wire and TBX's accessed are in good condition".

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT QUESTIONNAIRE INSTRUMENTS & CONTROL SYSTEMS			
	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AP.11	LEAK CONTROL SYSTEM		
AP.11.1	LEAK DET. PIT/SUMP INST.		
AP.11.1.1	Gamma Radiation Monitoring Subsystem		
AP.11.1.1.1	Gamma Probe Well Structure	Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.11.1.1.2	Gamma Probe & Well Cable	Inspect instrument cables where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.11.1.1.3	Field Signal Cable	Inspect instrument cables where accessible. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.11.1.1.4	reserved		
AP.16.5	HEAT TRACE SYSTEM STATUS INST.		
AP.16.6	CATHODIC PROTECTION SYSTEM STATUS INST.		"Unable to arrange access during the field inspection. No local readout was noted during the field inspection".
AP.17	HEAT TRACE CONTROL SYSTEM		"Heat trace controllers and display system is provided by Thermo model HTC316. No physical damage was noted and the display panel appears to be in good condition".
AP.17.1	TEMPERATURE MONITORING SENSORS		"Unable to arrange access during the field inspection".
AP.17.2	TEMP. CONTROLLER SUBSYSTEM		"Unable to arrange access during the field inspection".
AP.17.3	OVER TEMP. CONTROLLER SUBSYSTEM		"Unable to arrange access during the field inspection".

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT QUESTIONNAIRE INSTRUMENTS & CONTROL SYSTEMS			
	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AP.11	LEAK CONTROL SYSTEM		
AP.11.1	LEAK DET. PIT/SUMP INST.		
AP.11.1.1	Gamma Radiation Monitoring Subsystem		
AP.11.1.1.1	Gamma Probe Well Structure	Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.11.1.1.2	Gamma Probe & Well Cable	Inspect instrument cables where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Determine maintenance repair frequency for equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.11.1.1.3	Field Signal Cable	Inspect instrument cables where accessible. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Access could not be arranged at the time of the field inspection".
AP.11.1.1.4	reserved		
AP.17.4	HEATER CONTACTORS - OTHER WIRING		"Contactors and wiring that were accessible are in good condition".
AP.17.5	PIPELINE HEAT TRACE TAPE HEATERS		"Unable to arrange access during the field inspection".
AP.18	CATHODIC PROTECTION CONTROL SYSTEM		"Unable to arrange access during the field inspection".
AP.18.1	POWER CONTROLLER		"Unable to arrange access during the field inspection".
AP.18.2	WIRING/CONDUIT/TBX		"All wiring and TBX's accessed are in good condition".

4.7 CAIS data Sheets

241-AP INSTRUMENT SYSTEMS NARRATIVE

EQUIPMENT DESCRIPTION

Instrumentation for the leak detection and radiation monitoring is located in the tank annulus, leak detection pits, ventilation systems control, stack monitoring, farm area radiation monitoring, and waste transfer lines. A CAM monitoring cabinet is shared for two tanks for a total of four annulus radiation monitoring cabinets. There are two distinct leak detection pits, each of which contain a pair of leak detection systems. Both systems in a given pit monitor a total of four tanks.

Ventilation instrumentation includes stack monitoring cabinets for the primary and annulus systems, heater controls and alarms, and HEPA filter differential pressure gauges with high and low pressure alarms. The 271AP building instrumentation is all electrical or electronic signal supplied. No instrument air is supplied or needed to the 271 building. Instrument air is provided to the 241AP farm proper for use as purge air for the FIC and the flake boxes. Air is also provided for the specific gravity transmitters that are located in the transmitter/MUX cabinet enclosures.

SYSTEMS CONDITION SUMMARY

241AP.I1.2 ANNULUS LEAK INSTRUMENTATION

The annulus radiation monitoring cabinets are provided with pull out shelves, which greatly improves maintenance access to the CAMs. The pen recorders are in good condition but have acquired a history over the years to require frequent repair action. The liquid presence sensors (flake boxes) O-ring seals need to be replaced often.

241AP.I2.1 TANK PRIMARY VENTILATION SYSTEM

The pressure recorders are in good condition but have acquired a history over the years to require frequent repair action.

241AP.I4 TANK CONTENTS MONITORING SYSTEM

Failure of the FIC liquid level sensors are common. Should the sensor fail the tape is also usually damaged.

Deficiencies that were noted were few and minor in nature. The only significant areas of concern are the use of FIC liquid level instruments and the use of flake boxes in the annulus system. While no major deficiencies were recorded for this equipment, the requirement of air having to be supplied to purge the systems and there tendency to fail and require constant repair action as they age should be adequate justification to replace these systems with updated technology. Purge and instrument air supply moisture content and quality is not monitored.

Instrument air to the 271 building has been eliminated with the use of electronic or electric operated equipment. No deficiencies were recorded however, the various chart recorders used for the leak detection and ventilation systems have a history of chronic repair action as they age. "Ap" tank farm has been in service for approximately ten years and is in relative good condition.

The overall condition of the instrumentation on AP farm is rated as "good" 8.

CONDITION ASSESSMENT INFORMATION SYSTEM

Report : RELATED SITE EQUIPMENT
Filename : RPTEQPT.lis
Run by : CAIS
Report Date : 29-NOV-95
Parameters Entered
Parent Equipment ID: %

29-NOV-95

CONDITION ASSESSMENT INFORMATION SYSTEM

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Asset

Site Component
Survey Component
Survey Comment

Name

Sys No.

System Name

241AP-0000 : UNDRGRND WASTE STOR TANK FARM

241AP GAMMA RAD SYS

GAMMA RAD MONITOR SUBSYS

1.1.1 Gamma Radiation Monitoring Sub

241AP RIAS C-1

COUNT RATE METER/ALARM

1.1.1.5 Count Rate Meters/ Alarm Comparators.

CABLE,WIRING,TBX'S & CABINETS ARE IN GOOD CONDITION. CABINETS SHOW SIGNS OF DIRT DUE TO LATCHES NOT SECURED AFTER MAINT' S. EST AGE OF EQUIP.10YRS. MAINT.& REPAIR IS LOW. CALIBRATED EVERY 6MO. IN SHOP. NO RECURRENT PROBLEMS.

241AP WF&SpG SYS

WF&SpG MONITORING SUBSYSYEM

1.1.2 Weight Factor & Specific Gravi

241AP WFT C-1

WF XMITTER

1.1.2.2 Weight Factor & Specific Gravity Pressur

WIRE,CABLE,TUBING & TERMINATIONS ARE IN GOOD CONDITION. XMITTERS ARE BAILEYS WITH A MAX RANGE OF 150IN. W.G. WHICH SENDS A SIGNAL TO A TRACOR WESTRONIC MULTIPLE XER MODEL 60. CALIBRATION FREQUENCIES UNKNOWN.

241AP SGT C-1	SpG XMITTER	1.1.2.2 Weight Factor & Specific Gravity Pressur
WIRE,CABLE,TUBING & TERMINATIONS ARE IN GOOD CONDITION. XMITTERS ARE BAILEYS WITH A MAX RANGE OF 150IN. W.G. WHICH SENDS A SIGNAL TO A TRACOR WESTRONIC MULTIPLE XER MODEL 60. CALIBRATION FREQUENCIES UNKNOWN.		
241AP MUX106	MUX TRANSMITTER	1.1.2.3 Transmitter Mux. Cabinet (farm)
CABINETS ARE IN GOOD CONDITON BUT DIRT HAS ACCUMULATED IN THE BOTTOM OF THE CABINETS DUE TO IMPROPER LATCHING AFTER MAINT.		
241AP MUX 101	MUX TRANSMITTER	1.1.2.3 Transmitter Mux. Cabinet (farm)
CABINETS ARE IN GOOD CONDITON BUT DIRT HAS ACCUMULATED IN THE BOTTOM OF THE CABINETS DUE TO IMPROPER LATCHING AFTER MAINT.		
241AP MUX 102	MUX TRANSMITTER	1.1.2.3 Transmitter Mux. Cabinet (farm)

29-NOV-95

CONDITION ASSESSMENT INFORMATION SYSTEM

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Asset	Site Component	Name	Sys No.	System Name
	Survey Component	Survey Comment		

241AP-0000	: UNDRGRND WASTE STOR TANK FARM			
		CABINETS ARE IN GOOD CONDITIOIN BUT DIRT HAS ACCUMULATED IN THE BOTTOM OF THE CAB INETS DUE TO IMPROPER LATCHING AFTER MAI NT.		
	241AP MUX 104	MUX TRANSMITTER		1.1.2.3 Transmitter Mux. Cabinet (farm)
		CABINETS ARE IN GOOD CONDITIOIN BUT DIRT HAS ACCUMULATED IN THE BOTTOM OF THE CAB INETS DUE TO IMPROPER LATCHING AFTER MAI NT.		
	241AP MUX 108	MUX TRANSMITTER		1.1.2.3 Transmitter Mux. Cabinet (farm)
		CABINETS ARE IN GOOD CONDITIOIN BUT DIRT HAS ACCUMULATED IN THE BOTTOM OF THE CAB INETS DUE TO IMPROPER LATCHING AFTER MAI NT.		
	241AP MUX107	MUX TRANSMITTER		1.1.2.3 Transmitter Mux. Cabinet (farm)
		CABINETS ARE IN GOOD CONDITIOIN BUT DIRT HAS ACCUMULATED IN THE BOTTOM OF THE CAB INETS DUE TO IMPROPER LATCHING AFTER MAI NT.		

241AP MUX 105	MUX TRANSMITTER	1.1.2.3 Transmitter Mux. Cabinet (farm)
CABINETS ARE IN GOOD CONDITON BUT DIRT HAS ACCUMULATED IN THE BOTTOM OF THE CABINETS DUE TO IMPROPER LATCHING AFTER MAINT.		
241AP MUX 103	MUX TRANSMITTER	1.1.2.3 Transmitter Mux. Cabinet (farm)
CABINETS ARE IN GOOD CONDITON BUT DIRT HAS ACCUMULATED IN THE BOTTOM OF THE CABINETS DUE TO IMPROPER LATCHING AFTER MAINT.		
241AP-271-AR	ANALOG RACK	1.1.2.4 Analog Rack (241-AP-271)
THE ANALOG RACK IN 271 IS IN GOOD CONDITION.		
241AP ANALOG RACK	ANALOG RACK	1.1.2.4 Analog Rack (241-AP-271)
241AP LA C-1	ALARM INDICATION	1.1.2.5 Alarm Indication
NO VISUAL DEFICIENCIES NOTED		

CAIS Special Report - RPT-005

Asset	Site Component	Name	Sys No.	System Name
241AP-0000	: UNDRGRND WASTE STOR TANK FARM			
241AP ANN CAM	ANNULUS CAM	1.2.1	Annulus CAM Radiation Monitori	
241AP CAM-1	RAD ANALYZER	1.2.1.2	Radiation Analyzer	
241AP CAM-1 CAB	CABINET VENT PIT	1.2.1.3	Cabinet (Vent. Pit)	
241AP ANN LIQUID SENSOR	ANN LIQUID PRESENCE SENSOR	1.2.2	Annulus Liquid Presence Sensor	
241AP LDI-101-108 2 THUR 4	FLAKE BOXES IN TKS 101-108	1.2.2	Annulus Liquid Presence Sensor	

TION. EST AGE OF EQUIP 10 YRS. O-RING SEALS ARE FREQUENTLY REPLACED. FUNCTIONAL TEST PERFORMED MONTHLY. REQUIRES CONTINUOUS SUPPLY OF PURGE AIR.

241AP LDE-TK101-B1 ANN PUMP PIT LIQUID SENSOR 1.2.3 Annulus Pump Pit Liquid Presence Sensor

CABLES VIEWED IN TBX'S ARE IN GOOD CONDITION. EST AGE OF EQUIP IS 10 YRS. O-RING SEALS ARE REPLACED FREQUENTLY. FUNCTIONAL TEST PERFORMED MONTHLY. REQUIRES CONTINUOUS SUPPLY OF PURGE AIR.

241AP DAMPER CTRL SYS DAMPER CONTROL SUBSYSTEM 2.1.6 Damper Control Subsystem

241AP DPS 1 THRU 4 SURVEY DAMPER CONTROL SUBSYSTEM 2.1.6 Damper Control Subsystem

DAMPERS WERE FULLY FUNCTIONAL DURING INSPECTION NO DEFICIENCIES WERE NOTED.

241AP ANN DIFF ANNULUS DIFF. PRESSURE INST. 2.2.1 Annulus Diff. Pressure Inst. S

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CONDITION ASSESSMENT INFORMATION SYSTEM

CAIS Special Report - RPT-005

Asset	Site Component	Survey Component	Survey Comment	Name	Sys No.	System Name
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241AP-0000 : UNDERGRND WASTE STOR TANK FARM

241AP DPIS 7 THRU 20 ANN DIFF PRESS INST 2.2.1 Annulus Diff. Pressure Inst. Subsystem

INSTRUMENT TUBING IS IN GOOD CONDITION.
EST AGE OF EQUIP IS TEN YRS. LOW REPAIR
FREQUENCY. CALIBRATION IS PERFORMED ANNU
ALLY IN THE FIELD AT ONE HOUR PER INSTRU
MENT. NO KNOWN RECURRENT PROBLEMS.

241AP (296-A-27) REG STK MON REGULATED STACK MONITOR

241AP K-1&2-CAMS CAMS RADIATION ANALYZERS 2.1.8.2 CAMs (Radiation Analyzers)

NO DEFICIENCIES WERE NOTED FOR THE EBERL
INE CAMS. CABINETS ARE EQUIPED WITH PULL
OUT SHELVES FOR EASE OF MAINTENANCE AND
ACCESS.

241AP K1&2-RAD-MON-CAB STACK MONITOR CAM CABINETS 2.1.8.3 CAM Cabinets

THE CAM CABINETS ARE IN GOOD CONDITION.
MAINTENANCE ACCESS WAS IMPROVED WITH INS
TALLATION OF PULL OUT SHELVES.

241AP K1&2-VP-1&2 PRIMARY & ANNULUS VACUUM PUMPS 2.1.8.4 Vacuum Pumps

VACUUM PUMPS ARE IN GOOD CONDITION.

241AP RR-K1&K2-1-1 PEN RECORDER 2.1.8.5 ?-Pen Recorder (242-A?)

PEN RECORDERS ARE LOCATED IN 271AP. THE
RECORDERS ARE IN GOOD CONDITION. 242A WAS
NOT INCLUDED IN THE INSPECTION.

241AP TK CONT TANK CONTENTS MIXING SYSTEM

241AP ANN-HVAC-1 LOCAL ALARM INDICATION 5.1.2 Local Alarm Indication

LOCAL ALARM PANELS ARE IN GOOD CONDITION
WITH NO INDICATION OF PHYSICAL DAMAGE.

241AP V P VALVE POSITION INST INDICATION

241AP VLV POS IND "SURVEY" VALVE POS INST IND 3.2 VALVE POSITION INSTRUMENTATION/
INDICATION

Asset	Site Component	Name	Sys No.	System Name

241AP-0000	: UNDRGRND WASTE STOR TANK FARM			
VALVE POSITION INDICATION IS AT THE COVER BLOCKS AND IS TAKEN MANUALLY.				
MANUAL V CTRL SYSTEM			VALVE CONTROL SYSTEM	3.3 VALVE CONTROL SYSTEM
VALVE POSITION IS OBTAINED MANUALLY.				
241AP TNK LSL	TANK LIQUID SURFACE LEVEL INST			
FIC RISER EXTENSION	FIC RISER EXTENSION		4.4.1	FIC Riser Extension
THE RISER EXTENSION IS IN GOOD CONDITION WITH NO INDICATION OF CORROSION OR PHYSICAL DAMAGE.				
241AP LE-TK-101 THRU 108-1	FIC LEVEL SENSOR		4.4.2	FIC Level Sensor
TUBING IS IN GOOD CONDITION. EST AGE OF EQUIP IS TEN YRS. FAILURE OF THE SENSORS AND ELECTRONICS ARE COMMON. SHOULD THE SENSOR FAIL TO DETECT THE LIQUID LEVEL THE TAPE IS USUALLY DAMAGED ALSO.				

TBX'S	TERMINAL BOXES	4.4.4	FIC Buried Signal Cable
ALL TBX'S INSPECTED WERE IN GOOD CONDITION.			
241AP CAT PROTECT	CATHODIC PROTECTION CTRL SYS		
241AP WIRING/TBX/CONDUIT	WIRING/TBX/CONDUIT	8.2	WIRING/CONDUIT/TBX
ALL WIRING/TBX/CONDUIT ACCESSED WERE IN GOOD CONDITION.			
241AP HEATER CONTROLLER SYS	HEATER CONTROLLER SUBSYSTEM		
241AP KH1-1&2 KH2-1&2	HEATER CONTROLLER SUBSYSTEM	2.1.4	Heater Control Subsystem
WIRES ARE IN GOOD CONDITION. EST AGE OF EQUIP TEN YRS. ELECTRICIANS PERFORM FUNCTIONAL TESTS. NO KNOWN RECURRENT PROBLEMS (AP FARM HAS INSTALLED SOLID STATE CONTROLLERS MANUFACTURED BY CHROMOLOX).			

CAIS Special Report - RPT-005

Asset	Site Component	Name	Sys No.	System Name
	Survey Component			
	Survey Comment			

241AP-0000	: UNDRGRND WASTE STOR TANK FARM			
241AP PRI DIFF INST	HEPA FILTER DIFF PRESSURE INST			
241AP DPIS 1 THRU 6, 21&22	HEPA FILTER DIFF PRESSURE INST	2.1.2	HEPA Filter Diff. Pressure Instr.	
TUBING IS IN GOOD CONDITION. EST AGE OF EQUIP 10 YRS. CALIBRATION IS PERFORMED ANNUALLY IN THE FIELD AT 30 MINUTES PER INSTR. NO KNOWN RECURRENT PROBLEMS.				
241AP FAN MOTOR CONTROL	FAN MOTOR CONTROL SUBSYSTEM			
241AP MCC-302-C-1 THRU 4	FAN MOTOR CONTROL SUBSYSTEM	2.1.5	Fan-Motor Control Subsystem	
NO DEFICIENCIES WERE NOTED.				
241AP271-0000	: TANK FARM INSTRUMENT BUILDING			
241AP-271 PNL MPSR	MASTER PUMP SHUTDOWN RELAY PNL	1.4.1	241-AP-271 Master Pump Shutdown	
241AP-271 MPS CTRL	MPS CNTRL PANEL	1.4.2	MPS Pushbutton Control Panel	

CONTROL PANEL IS IN GOOD CONDITION.

241AP-271 SIGNAL WIRING SIGNAL WIRING/TBX/CONDUIT 1.4.3 Signal Wiring/Conduit/TBX

ALL CONDUIT TBX'S AND SIGNAL WIRING THAT
WAS ACCESSED IS IN GOOD CONDITION.

241AP TNK DIFF PRESS INST PRIMARY DIFF PRESS SUBSYS

MUX-CAB 101 THRU 108 XMITTER/MUX CABINETS 2.1.1.3 Transmitter/Mux Cabinet

ALL WIRING, TERMINATIONS & TUBING IN GOOD
CONDITION. ESTIMATED AGE = 10 YEARS. REPAIR
FREQUENCY LOW; FIELD CALIBRATION AT 1 HOUR/
INSTRUMENT. NO KNOWN REPAIR PROBLEMS.

241-AP-271 ANALOG RACK 2.1.1.4 Analog rack (241-AP-271)

NO VISUAL DEFICIENCIES NOTED.

241AP PR 101 THRU 108-1/-2 PRESSURE RECORDER 2.1.1.5 Pressure Recorder (241-AP-271)

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CONDITION ASSESSMENT INFORMATION SYSTEM

CAIS Special Report - RPT-005

Asset	Site Component	Name	Sys No.	System Name
Survey Component	Survey Comment			

241AP271-0000 : TANK FARM INSTRUMENT BUILDING

CABLES, WIRING, CABINETS & HOUSING IN GOOD CONDITION. EST EQUIPMENT AGE = 10 YEARS. CALIBRATION PERFORMED ANNUALLY IN THE FIELD @ 1 HOUR PER INSTRUMENT. CONTINUAL REPAIR ACTION IS EXPECTED TO KEEP EQUIPMENT WITHIN CALIBRATION TOLERANCES.

241AP-271 AC PWR ASSEMBLY AC PWR SUPPLY STATUS INST

241AP-271 AC PWR "SURVEY" AC PWR SUPPLY STATUS 6.1 AC POWER SUPPLY STATUS INST.
AC POWER SUPPLIES ARE IN GOOD CONDITION, WITH NO NEC VIOLATIONS NOTED.

241AP-271 TK-AP ANN ALARM PANELS 241AP-271

TK-AP-101 THRU 107 271AP ALARM PANEL 1.5.1 Alarm Panel (241-AP-271)

THE ALARM PANELS IN 271AP ARE IN GOOD CONDITION.

241AP-271 TK CONC STR T	TANK CONCRETE STRUCTURE TEMP.	
241AP-271TDS-AP-1&2	DATA LOGGER	6.4.1 Data Loggers (241-AP-271)
TEMP DISPLAY INSTRUMENTS INCLUDE TWO DISPLAY PANELS MANUFACTURED BY TRACOR WESTRONICS MODEL DDS7800. NO PHYSICAL DAMAGE NOTED AND THE DISPLAY PANELS WERE IN GOOD CONDITION.		
SIGNAL WIRING	SIGNAL WIRING/TBX/CONDUIT	6.4.3 Signal Wiring/Conduit/TBX
ALL SIGNAL WIRING, TBX & CONDUIT ACCESSORIES ARE IN GOOD CONDITION. TBX'S, WIRING & CONDUIT THAT WERE ACCESSED DURING THE INSPECTION WERE IN GOOD CONDITION.		
241AP-271 AIR	AIR SUPPLY STATUS	
241AP-271 AIR SUPPLY	AIR SUPPLY STATUS INST	6.2 AIR SUPPLY STATUS INST.

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CONDITION ASSESSMENT INFORMATION SYSTEM

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CAIS Special Report - RPT-005

Asset	Site Component	Name	Sys No.	System Name
Survey Component	Survey Comment			

241AP271-0000 : TANK FARM INSTRUMENT BUILDING

THE AIR COMPRESSOR AND IT'S ASSOCIATED CONTROLS AND AIR LINES ARE IN GOOD CONDITION. AIR QUALITY IS NOT MONITORED.

241AP-271 HT CTRL

HEAT TRACE CONTROL SYSTEM

HT CTRL "SURVEY"

HT CONTROL SYSTEM

7. HEAT TRACE CONTROL SYSTEM

HEAT TRACE CONTROLLERS AND DISPLAY SYSTEM IS PROVIDED BY THERMON MODEL HTC316.DI
SPLAY PANELS APPEAR TO BE IN GOOD CONDITION WITH NO PHYSICAL DAMAGE.

241AP HEATER CONTACTORS

HEATER CONTACTORS

7.4 HEATER CONTACTORS - OTHER WIRING

CONTACTORS AND WIRING THAT WERE ACCESSIBLE ARE IN GOOD CONDITION.

241AP-271 MPSR

MPS RELAY

241AP-271 PNL MPSR

MASTER PUMP SHUTDOWN RELAY PNL 1.4.1 241-AP-271 Master Pump Shutdown

Relay Pa

RELAY PANEL WIRING TERMINATIONS ARE IN G
OOD CONDITION.

4.8 Other Reports

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4.9 CAMP Work Sheets

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WHC-SD-W314-ES-018, Rev 0

CAMP RATING FORM

Project Title: AP T.F.: Leak Control System: Leak Det. Pit: Gamma Rad. Mon. Subsystem

B&R Code: _____ Rev #: 0 FY: 1996

Project Id #: AP.11.1.1 FUDS: _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.		30		30
Technological Base (R&D)		30		30
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics				
Criticality				
Infrastructure				40
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				30
Mission Capability, Capacity, & Quality				40
Asset Condition				55
National Business Strategies/Partnerships				
Highest of Each Subcategory	20	30	20	55

PROJECT RATING:	56
Final Project Rating	56

Note: 20 is a Default Rating

C.D. Acree	376-1901	9/29/95
Rated By	Ext	Date Rated

Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

ER/WM, Compliance, 30: Minimum detection capability lacking
M&I, Asset Condition, 55: Aging System, Spare Parts availability concern.
M&I, Infrastructure, 40: Substandard Operation
M&I, Mission Capability, 40: System not designed to operate in a wet environment.

Additional Information & Affected Projects

Shaded Areas Are Not For Use

WHC-SD-W314-ES-018, Rev 0

CAMP RATING FORM

Project Title: AP Tank Farm/Leak Control System/Leak Detection System/Pit WF&SpG Monitor

B&R Code: _____ Rev #: 0 FY: 1996

Project Id #: AP.11.1.2 FUDS: _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.				
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics				
Criticality				
Infrastructure				40
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				45
Asset Condition				35
National Business Strategies/Partnerships				
Highest of Each Subcategory	20	20	20	45

PROJECT RATING:	45
Final Project Rating	45

Note: 20 is a Default Rating

C. D. Acree		9/29/95
Rated By	Ext	Date Rated

Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

M&I, Capability, 45: Does not measure liquid level directly, uses pressure.
M&I, Infrastructure, 40: system is continuous user of instrument air.

Additional Information & Affected Projects

M&I, Asset Condition, 35: System difficult to calibrate.

Shaded Areas Are Not For Use

WHC-SD-W314-ES-018, Rev 0

CAMP RATING FORM

Project Title: AP Tank Farm Annulus Leak Instrumentation/ CAM Rad. monitoring System

B&R Code: _____ Rev #: 0 FY: 1996

Project Id #: AP.11.2.1 FUDS: _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.				
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety	35			
Fire Protection				
Health Physics	40			
Criticality				
Infrastructure				40
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				40
Asset Condition				30
National Business Strategies/Partnerships				
Highest of Each Subcategory	40	20	20	40

PROJECT RATING:	43
Final Project Rating	43

Note: 20 is a Default Rating

C. D. Acree		9/29/95
Rated By	Ext	Date Rated
Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

H&S, Health Physics, 40: Potential for personnel radiation exposure.
H&S, Industrial Safety, 35: Potential for personnel injury lifting CAM unit (100lbs)

Additional Information & Affected Projects

M&I, Asset Condition, 30: Aging System, subject to false alarms
M&I, Mission Capability, 40: Aging system, not latest recommend site standard, false alarms, radon interf
M&I, Infrastructure, 40: Aging System, subject to false alarms & difficult to lift/maintain

WHC-SD-W314-ES-018, Rev 0

CAMP RATING FORM

Project Title: AP Tank Farm annulus Leak Inst./Manual Tape Cond. Probe (FlakeBox)

B&R Code: _____ Rev #: 0 FY: 1996

Project Id #: AP.I1.2.2 FUDS: _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.		40		
Technological Base (R&D)				30
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics				
Criticality				
Infrastructure				40
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				45
Asset Condition				50
National Business Strategies/Partnerships				
Highest of Each Subcategory	20	40	20	50

PROJECT RATING: 52
Final Project Rating 52
Note: 20 is a Default Rating

C. D. Acree
Rated By _____ Ext _____ Date Rated 9/29/95

Reviewed By _____ Ext _____ Date Reviewed _____

Applicable Regulations or Policies

M&I, Asset Condition, 50: Deteriorated, UV damaged, elec insulation failure
M&I, Mission Capability, 45: Not a good leak detect. inst., manual operation
ER/WM, Compliance, 40: Fails to detect some leaks, subject to operator interpretation.

Additional Information & Affected Projects

M&I, Infrastructure, 40: Aging System, large consumer of instrument air.
M&I, Tech. Base, 30: Not a standard industrial design, expensive to fabricate.

WHC-SD-W314-ES-018, Rev 0 **CAMP RATING FORM**

Project Title: AP Tank Farm/Pipeline Leak Inst./PitLiquid Leak Detect. Sub. Sys./COB, Transfer

B&R Code: _____ **Rev #:** 0 **FY:** 1996

Project Id #: AP.I1.3.1, AW.I1.3.3, AW.I1.1.3, AW.I1.2.3 **FUDS:** _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.		50		
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety	35			
Fire Protection				
Health Physics	50			
Criticality				
Infrastructure				
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				50
Asset Condition				55
National Business Strategies/Partnerships				
Highest of Each Subcategory	50	50	20	55

PROJECT RATING:	60
Final Project Rating	60

Note: 20 is a Default Rating

<u>C. D. Acree</u>		<u>9/18/95</u>
Rated By	Ext	Date Rated

Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

H&S, Health Physics, 50: Potential for maintenance personnel radiation exposure.
H&S, Industrial Safety, 35: Potential for personnel injury working in pits.
ER/WM, Compliance, 50: Cannot detect small leaks or detect secondary containment failure.

Additional Information & Affected Projects

M&I, Asset Condition, 40: System, subject to false alarms
M&I, Mission Capability, 50: System cannot detect small leaks, cannot detect secondary containment failure, cannot calibrate system, cannot verify system operability .

Shaded Areas Are Not For Use

WHC-SD-W314-ES-018, Rev 0

CAMP RATING FORM

Project Title: AP Tank Farm/Pipeline Leak Inst./Pipeline Annulus Pressure Sensor

B&R Code: _____ **Rev #:** 0 **FY:** 1996

Project Id #: AP.I1.3.2 **FUDS:** _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.		50		
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety	35			
Fire Protection				
Health Physics	50			
Criticality				
Infrastructure				40
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				50
Asset Condition				
National Business Strategies/Partnerships				
Highest of Each Subcategory	50	50	20	50

PROJECT RATING:	56
Final Project Rating	56

Note: 20 is a Default Rating

C. D. Acree		9/29/95
Rated By	Ext	Date Rated
Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

ER/WM, Compliance, 50: Pipelines do not have Inst. that can detect pl secondary containment failure.
M&I, Mission Capability, 50: System sensitivity is unknown, it cannot be calibrated, is difficult to verify operability, not available on all pipelines.

Additional Information & Affected Projects

H&S, Health Physics, 50: Potential for maintenance personnel radiation exposure.

M&I, Infrastructure, 40: System is continual user of instrument air.

(See AP.I1.3.1)

Shaded Areas Are Not For Use

WHC-SD-W314-ES-018, Rev 0

CAMP RATING FORM

Project Title: AP Tank Farm Pump Permissive (Master Pump Shutdown)

B&R Code: _____ **Rev #:** 0 **FY:** 1996

Project Id #: AP.11.4 **FUDS:** _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.				
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics				
Criticality				
Infrastructure				45
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				55
Asset Condition				
National Business Strategies/Partnerships				
Highest of Each Subcategory	20	20	20	55

PROJECT RATING:	55
Final Project Rating	55

Note: 20 is a Default Rating

C. D. Acree		9/29/95
Rated By	Ext	Date Rated
Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

M&I, Mission Capability, 55: Mission adversely impacted by false alarms, any alarm in all tank farms can shut down a transfer, even in farms that are unrelated.

M&I, Infrastructure, 45: Spurious shutdowns cause delays and idle lots of people.

Additional Information & Affected Projects

M&I, Mission Capability, 55: System provide no operational versatility. Cannot easily make simultaneous transfers. Cannot easily isolate operations in different facilities.

Shaded Areas Are Not For Use

WHC-SD-W314-ES-018, Rev 0 **CAMP RATING FORM**

Project Title: AP Tank Farm Remote Alarm Signaling System (Gamewall Loop Sys.)

B&R Code: _____ **Rev #:** 0 **FY:** 1996

Project Id #: AP.11.6 **FUDS:** _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.				
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics				
Criticality				
Infrastructure				40
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				35
Asset Condition				50
National Business Strategies/Partnerships				
Highest of Each Subcategory	20	20	20	50

PROJECT RATING:	50
Final Project Rating	50

Note: 20 is a Default Rating

<u>C. D. Acree</u>		<u>9/29/96</u>
Rated By	Ext	Date Rated

Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

M&I, Infrastructure, 40: Poor interface design, not standard hardware, spare parts problem.
M&I, Mission Capability, 35: System does not provide unique alarm identification.

M&I, Asset Condition, 50: System in poor condition, maintenance intensive, mostly doesn't work.

Additional Information & Affected Projects

WHC-SD-W314-ES-018, Rev 0 **CAMP RATING FORM**

Project Title: AP Tank Farm Tank Waste High Level Alarm Subsystem

B&R Code: _____ **Rev #:** 0 **FY:** 1996

Project Id #: AP.11.7 **FUDS:** _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.				
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics	45			
Criticality				
Infrastructure				40
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				55
Asset Condition				35
National Business Strategies/Partnerships				
Highest of Each Subcategory	45	20	20	55

PROJECT RATING:	57
Final Project Rating	57

Note: 20 is a Default Rating

<u>C. D. Acree</u>		<u>9/29/95</u>
Rated By	Ext	Date Rated
Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

M&I, Asset Condition, 35: System, equipment is similar to Leak Detection System.
M&I, Mission Capability, 55: Cannot calibrate probe, cannot verify probe is functional.
System is not intrinsically safe, not suitable for hazardous gas environment.

Additional Information & Affected Projects

H&S, Health Physics, 45: Probe maintenance will expose workers to radiation. .
M&I, Infrastructure, 40: Maintenance of probe is difficult.

CAMP RATING FORMProject Title: AP Tank Farm/Primary Ventilation/Regulated Stack Monitoring SystemB&R Code: _____ Rev #: 0 FY: 1996Project Id #: AP.12.1.8 FUDS: _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.		55		
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics	45			
Criticality				
Infrastructure				40
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				55
Asset Condition				45
National Business Strategies/Partnerships				
Highest of Each Subcategory	45	55	20	55

PROJECT RATING:	60
Final Project Rating	60

Note: 20 is a Default Rating

C. D. Acree		9/29/95
Rated By	Ext	Date Rated
Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

ER/WM, Compliance, 55: System is not compliant with regulatory requirements.
 M&I, Mission Capability, 55: System can not detect at required limits, systems does not detect other required gaseous emissions. Not latest recommended site standard CAM

Additional Information & Affected Projects

M&I, Asset condition, 45: Aging system, difficult to lift/maintain.
 H&S, Health Physics, 45: Potential radiation exposure to maintenance personnel.
 M&I, Infrastructure, 40: Aging system, difficult to status HVAC system.

Shaded Areas Are Not For Use

WHC-SD-W314-ES-018, Rev 0

CAMP RATING FORM

Project Title: AP DST WASTE; THERMOCOUPLE TREES

B&R Code: _____ **Rev #:** _____ **FY:** _____

Project Id #: AP.14.1 **FUDS:** _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.				
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics	40			
Criticality				
Infrastructure				40
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				40
Asset Condition				35
National Business Strategies/Partnerships				
Highest of Each Subcategory	40	20	20	40

PROJECT RATING: **43**

Final Project Rating **43**

Note: 20 is a Default Rating

Rated By	Ext	Date Rated
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Reviewed By	Ext	Date Reviewed
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Applicable Regulations or Policies

M&I, Capability, 40: Elements cannot be calibrated. Elements spaced at 2 ft. limits measurement capability.

Note: Probes may not withstand mixer pump forces.

M&I, Asset Condition, 35: Probes are of an old design but are still functional.

Additional Information & Affected Projects

M&I, Infrastructure, 40: Elements are not replaceable, thus probe is not maintainable.

H&S, Health Physics, 40: Probe replacement may expose workers to radiation.

Shaded Areas Are Not For Use

WHC-SD-W314-ES-018, Rev 0

CAMP RATING FORM

Project Title: AP DST WASTE; FIC LIQUID SURFACE LEVEL INST. SUBSYSTEM

B&R Code: _____ Rev #: _____ FY: _____

Project Id #: AP.14.4 FUDS: _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.				
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics	35			
Criticality				
Infrastructure				50
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				60
Asset Condition				60
National Business Strategies/Partnerships				
Highest of Each Subcategory	35	20	20	60

PROJECT RATING:	61
Final Project Rating	61

Note: 20 is a Default Rating

C. D. Acree		9/29/95
Rated By	Ext	Date Rated

Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

M&I, Asset Condition, 60: Extensive maintenance is normally required. Future spare parts problem.
M&I, Capability, 60: FIC Gauges have poor resolution.
M&I, Infrastructure, 50: Poor resolution of FIC gauges exacerbates mass balance computation
for checking waste transfer operations.

Additional Information & Affected Projects

H&S, Health Physics, 35: Maintenance of the FIC may expose workers to radiation.

Shaded Areas Are Not For Use

WHC-SD-W314-ES-018, Rev 0 **CAMP RATING FORM**

Project Title: AP Tank Farm/Pipeline Heat Trace I&C Subsystem

B&R Code: _____ **Rev #:** 0 **FY:** 1996

Project Id #: AP.17 **FUDS:** _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.				
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics				
Criticality				
Infrastructure				40
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				40
Asset Condition				50
National Business Strategies/Partnerships				
Highest of Each Subcategory	20	20	20	50

PROJECT RATING: 50
Final Project Rating 50

Note: 20 is a Default Rating

C. D. Acree Ext 9/29/95
Rated By **Ext** **Date Rated**

Reviewed By **Ext** **Date Reviewed**

Applicable Regulations or Policies

M&I, Asset Condition, 50: Some Pipelines have broken heat trace heaters.
M&I, Capability, 40:
M&I, Infrastructure, 40: Lack of pipe heating may affect transfer capability on some pipelines.

Additional Information & Affected Projects

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Accession #: D196011681

Document #: SD-W314-ES-018

Title/Desc:

PROJECT W-314 DST & DCRT INSTRUMENT & CONTROL
SYSTEMS INITIAL ASSESSMENT [SEC 2 OF 3]

Pages: 385

This document was too large to scan as a whole document, therefore it required breaking into smaller sections.

DOCUMENT NUMBER: SD-W314-ES-018

SECTION 2 OF 3

TITLE: PROJECT W-314 DST + DCRT INSTRUMENT +
CONTROL SYSTEMS INITIAL ASSESSMENT
(REV 0)

DATE: 01/23/96

ORIGINATOR: ACREE CD

CO: WHC

RECIPIENT: _____

CO: DOE-RL

REFERENCES: EDT-601994

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5.0 AW TANK FARM

5.1 PDRD Cross Reference Tables

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PROJECT W-314
PDRD CROSS REFERENCE TABLE
INSTRUMENT & CONTROL SYSTEMS

PDRD FUNCTION ID#	PDRD FUNCTION VERB	PDRD DATA VARIABLE	EQUIPMENT REFERENCE TREE	COMMENTS
3.2.1.1.1.1	Monitor	Hydroxide conc.	Non-existent architecture	Manual Sampling, Lab. Analysis function
3.2.1.1.1.1	Monitor	Nitrate concentration	Non-existent architecture	Manual Sampling, Lab. Analysis function
3.2.1.1.1.1	Monitor	Nitrite concentration	Non-existent architecture	Manual Sampling, Lab. Analysis function
3.2.1.1.1.1	Monitor	Sodium concentration	Non-existent architecture	Manual Sampling, Lab. Analysis function
3.2.1.1.1.1	Monitor	Specific Gravity	AW.14.3.1	Only 102-AW has SpG Monitoring System
3.2.1.1.1.1.2	Compare	Hydroxide conc.	Non-existent architecture	Lab. Analysis function
3.2.1.1.1.1.2	Compare	Nitrate concentration	Non-existent architecture	Lab. Analysis function
3.2.1.1.1.1.2	Compare	Nitrite concentration	Non-existent architecture	Lab. Analysis function
3.2.1.1.1.2.1.2	Compare	Specific Gravity	Not Assessed	Administrative function, 102-AW SpG Monitoring System is just Monitoring.
3.2.1.1.1.2.1.3	Compare	Sodium concentration	Non-existent architecture	Lab. Analysis function
3.2.1.1.1.2.1.4	Compare	Pu concentration	Non-existent architecture	Lab. Analysis function
3.2.1.1.1.3	Alarm	Waste composition	Non-existent architecture	Administrative function
3.2.1.1.1.4	Control	Waste composition	Non-existent architecture	Administrative function
3.2.1.1.1.5	Monitor	Supernate Liquid Level	AW.14.4.2	Old FIC gauges are being replaced with Enraf gauges
			AW.11.7	Old high level probes, field wiring and relays require replacement.
3.2.1.1.1.6	Compare	Supernate Liquid Level	Not Assessed	Old CASS computer function, TMACS will replace
3.2.1.1.1.7	Alarm	Supernate Liquid Level	AW.11.4	Old relays work in Master Pump Shutdown (re: AW.11.4)
			Not Assessed	Old CASS computer function, TMACS will replace.
			AW.11.5	Local Alarm function (re: AW.11.5)
3.2.1.1.1.8	Control	Supernate Liquid Level	Not Assessed AW.13.1	Administrative function, Manual Pump control
3.2.1.1.1.9	Monitor	Waste Temperature	AW.14.1	A new MIT was installed in 102-AW in FY95. Old Manual Operation, TMACS will replace.

PROJECT W-314
PDRD CROSS REFERENCE TABLE
INSTRUMENT & CONTROL SYSTEMS

PDRD FUNCTION ID#	PDRD FUNCTION VERB	PDRD DATA VARIABLE	EQUIPMENT REFERENCE TREE	COMMENTS
3.2.1.1.1.10	Compare	Waste Temperature	Not Assessed	Old Manual Input to CASS, TMACS will replace.
3.2.1.1.1.11	Alarm	Waste Temperature	Not Assessed	Old Output Report from CASS, TMACS will replace.
3.2.1.1.1.12 3.2.1.2.1.1	Control	Waste Temperature (indirectly) Ventilation System Airflow	Not Assessed re: AW.12.1.5 See HVAC Assessment	Administrative function Manual adjustment required
3.2.1.1.1.13	Monitor	Waste Level	AW.14.4.2	Enrafs are replacing the old FIC. See part 3.2.1.1.1.5
3.2.1.1.1.14	Compare	Waste Level	Not Assessed	See 3.2.1.1.1.6
3.2.1.1.1.15	Alarm	Waste Level	Not Assessed	See 3.2.1.1.1.7
3.2.1.1.1.16	Control	Waste Level	No automatic control architecture, re: AW.13.1	Administrative function
3.2.1.1.1.17(1)	Monitor	Leak Det. Pit Radiation Level	AW.11.1.1	
3.2.1.1.1.17(1)	Monitor	Leak Det. Pit Temperature	AW.11.1.4, Not Assessed	Suggest deletion and revised PDRD.
3.2.1.1.1.17(1)	Monitor	Leak Det. Pit Waste Level	AW.11.1.2	
3.2.1.1.1.17(2)	Monitor	Tank Annulus Radiation Level	AW.11.2.1	
3.2.1.1.1.17(2)	Monitor	Tank Annulus Liquid Presence/Level	AW.11.2.2	
3.2.1.1.1.18	Compare	Leak Det. Pit Radiation Level	AW.11.1.1.5	
3.2.1.1.1.18	Compare	Leak Det. Pit Temperature	Not Assessed	Suggest deletion and revised PDRD.
3.2.1.1.1.18	Compare	Leak Det. Pit Water Level	AW.11.1.2.5	
3.2.1.1.1.18	Compare	Tank Annulus Radiation Level	AW.11.2.1.4	

PROJECT W-314 PDRD CROSS REFERENCE TABLE INSTRUMENT & CONTROL SYSTEMS				
PDRD FUNCTION ID#	PDRD FUNCTION VERB	PDRD DATA VARIABLE	EQUIPMENT REFERENCE TREE	COMMENTS
3.2.1.1.1.18	Compare	Tank Annulus Liquid Presence/Level	AW.11.2.2	
3.2.1.1.1.19	Alarm	Leakage From Tank Bottom	AW.11.2.1.4	
3.2.1.1.1.19	Alarm	Leakage From Tank Annulus	AW.11.1.2.5 AW.11.1.1.5	
3.2.1.1.1.20	Control	Leakage From Tank Bottom	Not Assessed re: AW.13.1 & L.D.P pump	Administrative function
3.2.1.1.1.20	Control	Leakage From Tank Annulus	Not Assessed	Administrative function
3.2.1.1.1.21	Monitor	Leak Det. Pit Liquid Level	See 3.2.1.1.1.17(.1)	
3.2.1.1.1.22	Compare	Leak Det. Pit Liquid Level	See 3.2.1.1.1.18	
3.2.1.1.1.23	Alarm	Leak Det. Pit Liquid Level	See 3.2.1.1.1	
3.2.1.1.1.24	Control	Leak Det. Pit Liquid Level	AW.11.1.2.5	
3.2.1.1.1.25	Monitor	Tank Vapor Space Temperature Gradient	AW.14.1	Old CASS Data Loggers. Old manual operation, TMACS will replace Data Logger function.
3.2.1.1.1.26	Compare	Tank Vapor Space Temperature Gradient	Not Assessed	Old CASS operation, TMACS will replace Data Logger function.
3.2.1.1.1.27	Alarm	Tank Vapor Space Temperature Gradient	Not Assessed	Old CASS operation, TMACS will replace Data Logger function.
3.2.1.1.1.28	Control	Tank Vapor Space Temperature Gradient	Not Assessed re: AW.12.1.5	Administrative function
3.2.1.1.1.29	Monitor	Tank [Concrete] Structure Temperature	AW.16.4	Old Data Logger connects to CASS, is defective. TMACS will connect selected points.
3.2.1.1.1.30	Compare	Tank [Concrete] Structure Temperature	Not Assessed	Old CASS operation, TMACS will replace data logger function.

PROJECT W-314 PDRD CROSS REFERENCE TABLE INSTRUMENT & CONTROL SYSTEMS				
PDRD FUNCTION ID#	PDRD FUNCTION VERB	PDRD DATA VARIABLE	EQUIPMENT REFERENCE TREE	COMMENTS
3.2.1.1.1.31	Alarm	Tank (Concrete) Structure Temperature	Not Assessed	Old CASS operation, TMACS will replace data logger function.
3.2.1.1.1.32 3.2.1.2.1.1.2	Control	Tank (Concrete) Structure Temperature (indirectly) Ventilation System Airflow	Not Assessed re: AW.I2.1.1.5	Administrative function
3.2.1.1.1.33	Monitor	Tank Vapor Space Pressure	AW.I2.1.1.2 AW.I2.1.1.5	
3.2.1.1.1.34	Compare	Tank Vapor Space Pressure	AW.I2.1.1.4	
3.2.1.1.1.35	Alarm	Tank Vapor Space Pressure	AW.I2.1.1.4	
3.2.1.1.1.36	Control	Tank Vapor Space Pressure	Not Assessed re: AW.I2.1.1.5 & AW.I2.1.1.6	Administrative function.
3.2.1.1.1.37	Monitor	Tank Flammable Gas Concentration	AW.I4.2, Not Assessed	New System (SHMS)
3.2.1.1.1.38	Compare	Tank Flammable Gas Concentration	AW.I4.2, Not Assessed	New System (SHMS), tie in to TMACS required
3.2.1.1.1.39	Alarm	Tank Flammable Gas Concentration	AW.I4.2, Not Assessed	New System (SHMS), tie in to TMACS required
3.2.1.1.1.40 3.2.1.2.4 3.2.1.2.5	Control (Maintain, Adjust)	Tank Flammable Gas Concentration Tank Ventilation System Airflow	Not Assessed re: AW.I2.1.1.5 & AW.I2.1.1.6	Administrative function. A Trade Study should assess need for a tie-in to the new HVAC control system.
3.2.1.1.1.41	Monitor	Untreated Gaseous Effluent Temperature	AW.I2.1.1.3	Also see AW.I2.1.1.4, Heater Control System
3.2.1.1.1.42	Monitor	Treated Gaseous Effluent Radionuclide Particulate Concentrations	AW.I2.1.8	
3.2.1.1.1.42	Monitor	Treated Gaseous Effluent Temperature	AW.I2.1.8	

PROJECT W-314 PDRD CROSS REFERENCE TABLE INSTRUMENT & CONTROL SYSTEMS				
PDRD FUNCTION ID#	PDRD FUNCTION VERB	PDRD DATA VARIABLE	EQUIPMENT REFERENCE TREE	COMMENTS
3.2.1.1.1.42	Monitor	Treated Gaseous Effluent Moisture Level	Non-existent architecture	
3.2.1.1.1.42	Monitor	Treated Gaseous Effluent Organic Vapor Concentration	Non-existent architecture	
3.2.1.1.1.42	Monitor	Treated Gaseous Effluent Hazardous/ Toxic Vapor - Particulate Concentrations	Non-existent architecture	
3.2.1.1.1.43(1)	Compare	Treated Gaseous Effluent Radionuclide Particulate Concentrations	AW.12.1.8 See HVAC Assessment	
3.2.1.1.1.43	Compare	Treated Gaseous Effluent Temperature	AW.12.1.8	
3.2.1.1.1.43	Compare	Treated Gaseous Effluent Moisture Level	Non-existent architecture	
3.2.1.1.1.43	Compare	Treated Gaseous Effluent Organic Vapor Concentration	Non-existent architecture	
3.2.1.1.1.43(2)	Compare	Treated Gaseous Effluent Hazardous/ Toxic Vapor - Particulate Concentrations	Non-existent architecture	
3.2.1.1.1.44	Alarm	Treated Gaseous Effluent Radionuclide Particulate Concentrations	AW.12.1.8	Recorders in 242-A. Data should be tied into TMACS
3.2.1.1.1.44	Alarm	Treated Gaseous Effluent Temperature	Not Assessed	
3.2.1.1.1.44	Alarm	Treated Gaseous Effluent Moisture Level	Non-existent architecture	
3.2.1.1.1.44	Alarm	Treated Gaseous Effluent Organic Vapor Concentration	Non-existent architecture	

PROJECT W-314 PDRD CROSS REFERENCE TABLE INSTRUMENT & CONTROL SYSTEMS				
PDRD FUNCTION ID#	PDRD FUNCTION VERB	PDRD DATA VARIABLE	EQUIPMENT REFERENCE TREE	COMMENTS
3.2.1.1.1.44	Alarm	Treated Gaseous Effluent Hazardous/ Toxic Vapor - Particulate Concentrations	Non-existent architecture	
3.2.1.1.1.45	Control	Treated Gaseous Effluent Radionuclide Particulate Concentrations	Not Assessed re: AN.12.1.5 & AN.12.1.6	Administrative function.
3.2.1.1.1.45	Control	Treated Gaseous Effluent Temperature	Not Assessed	Administrative function.
3.2.1.1.1.45 3.2.1.2.7	Control	Treated Gaseous Effluent Moisture Level (indirectly) Tank Ventilation System	Non-existent architecture	Administrative function.
3.2.1.1.1.45	Control	Treated Gaseous Effluent Organic Vapor Concentration	Non-existent architecture	Administrative function.
3.2.1.1.1.45 3.2.1.2.8	Control	Treated Gaseous Effluent Hazardous/ Toxic Vapor - Particulate Concentrations (indirectly) Tank Ventilation System	Non-existent architecture	Administrative function.
3.2.1.1.2.2	Monitor	Essential Transfer Tank Systems/Equipment Operability Status (eg. vent. sys., waste level monitor, etc)	Non-existent architecture	Presently, Operator rounds required. Annunciator Panel Data need to be on TMACS.
3.2.1.1.2.3	Monitor	Essential Interconnecting Systems/Equipment Operability Status (eg. heat trace, valves, pumps, etc)	AW.16, Not Assessed	Presently, Operator rounds required. Annunciator Panel Data need to be on TMACS.
3.2.1.1.2.4	Monitor	Transfer System Operability Status (leak detection system	AW.11.3 AW.11.4	Presently, Operator rounds required.

PROJECT W-314 PDRD CROSS REFERENCE TABLE INSTRUMENT & CONTROL SYSTEMS				
PDRD FUNCTION ID #	PDRD FUNCTION VERB	PDRD DATA VARIABLE	EQUIPMENT REFERENCE TREE	COMMENTS
3.2.1.1.2.5	Monitor	Essential Equipment Operability Status	AW.16	Presently, Operator rounds required. Annunciator Panel Data need to be on TMACS.
3.2.1.1.2.6	Monitor	Waste Parameters Temperature Viscosity Specific Gravity	AW.14 AW.14.1 AW.14.3	SpG monitoring available only for 102-AW.
3.2.1.1.2.7	Detect	Waste Transfer System Containment Leaks	AW.11.3 AW.11.1.3 AW.11.2.3	
3.2.1.1.2.8	Monitor	Effluents	Non-existent architecture	No effluents in the Tank Farm. Service pit monitors water flow utilized for washdown.
3.2.1.1.2.9	Monitor	Motive Force	See Electrical Assessment (re: AW.13.1)	Manual ON-OFF control, local indicators of ON-OFF condition.
3.2.1.1.2.9	Control	Motive Force	See Electrical Assessment (re: AW.13.1)	Manual ON-OFF control
3.2.1.1.2.10	Monitor	Transfer Route Isolation Devices	I&C Non-existent architecture, (re: AW.13.3) See Pipeline Assessment	Manual Indication
3.2.1.1.2.10	Control	Transfer Route Isolation Devices	I&C Non-existent architecture, (re: AW.13.3) See Pipeline Assessment	Manual Operation.
3.2.1.1.2.11	Monitor	Transfer Line Waste Flow Rate	Non-existent architecture	
3.2.1.1.2.12	Monitor & Compare (Verify)	Transfer Volume	Non-existent architecture	Administrative function.
3.2.1.1.2.13	Alarm (Annunciate)	Waste Transfer System- Structure-Component Fault(s)	AW.11.5	Administrative function. Alarm Status assessed via Operator rounds & via CASS reports.
3.2.1.1.14	Control (Activate)	Waste Transfer Safe Shutdown Systems	AW.11.4	

PROJECT W-314 PDRD CROSS REFERENCE TABLE INSTRUMENT & CONTROL SYSTEMS				
PDRD FUNCTION ID#	PDRD FUNCTION VERB	PDRD DATA VARIABLE	EQUIPMENT REFERENCE TREE	COMMENTS
3.2.1.1.2.15	Monitor & Compare (Verify)	Waste Transfer System Safe Shutdown	Non-existent architecture	Function not implemented with I & C.
3.2.1.1.2.16	Control (Secure)	Failed Waste Transfer System Equipment	Non-existent architecture	Function not implemented with I & C.
3.2.1.1.3	Manage Obtain Analyze Process Store Archive	System Data/Information	Data Acquisition System Not Assessed AW.11.2.1.4 AW.12.1.1.5 AW.11.6 (re: AW.14.4.5)	Chart recorders in 241-AW-271 should be functionally replaced.
3.2.1.2.3.1	Monitor	Tank Annulus Pressure	AW.12.2.1 See HVAC Assessment	Existing equipment is manual, data needs to be connected to TMACS.
3.2.1.2.3.1	Control (Maintain)	Tank Annulus Pressure	Not Assessed re: AW.12.1.5	Manual operator function.
3.2.1.3.4	Monitor	Waste Transfer System Containment Pressure	In general, Non-existent architecture (re: AW.13.4) See Pipeline Assessment	
3.2.1.3.4	Control	Waste Transfer System Containment Pressure	In general, Non-existent architecture See Pipeline Assessment	
3.3.1.2.3.1	Monitor	Sludge Volume	AW.14.5 Not Assessed	
3.3.4.1.6	Monitor	CAMs Radiation Remote Centralized Data & Alarm Display	Not Assessed	Personal protection monitoring is not monitored by TMACS. Local indication only.

5.2 Functions Assessment Tables

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EXISTING TANK FARM EQUIPMENT
FUNCTIONS ASSESSMENT TABLE
INSTRUMENTS & CONTROL SYSTEMS

REF. NO	SYSTEM NAME	FUNCTION OR CONSTRAINT			METHOD OF ANALYSIS I. Analysis II. Inspection III. Testing	BRIEF REASON FOR DECISION
		DESCRIPTION	SOURCE	MET		
AW.11	LEAK CONTROL SYSTEM	3.2.1.1.2.4 3.2.3.3 3.2.3.4	PORD	NO	I. See the Engineering Analysis	Verification of the operability of the transfer route leak sensors is not reliable because of the design of the liquid presence sensors and the manual process utilized to test each sensor. These sensors can not be calibrated.
AW.11.1	LEAK DET. PIT/SUMP INST.					
AW.11.1.1	Gamma Radiation Monitoring Subsystem	3.2.1.1.1.17	PORD	NO	I. See the Engineering Analysis. IIa. See Field Inspection Questionnaire. IIb. See CAS Data Sheets.	The instrument thimble often contains water due to condensation and possible rainwater infiltration. The relation between the output indication of this system and leak rate detection is not well defined. Erratic operation is currently being experienced as a result of induced 60HZ interference and water induced short circuiting. Sensor connectors and their cable are sometimes underwater. This system is not designed for submerged use. Cable life expectancy in this environment is poor.
AW.11.1.2	Weight Factor & Specific Gravity Monitoring Subsystem	3.2.1.1.1.17	PORD	NO	I. See the Engineering Analysis. IIa. See Field Inspection Questionnaire. IIb. See Inst. CAS Data Sheets.	This is complex pneumatic technology that does not directly measure liquid surface level. Better instrumentation exists that does not use instrument air. Potential degradation of inst. air piping may lead to a degradation of inst. air quality with subsequent pneumatic inst. problems. A Trade Study should be carried out to verify the need for this architecture.
AW.11.1.3	Liquid Presence Sensor and Buried wiring	3.2.1.1.2.7	1. PORD, WAC-173-303- #180(4)(c)(iii), 40CFR-Ch1 - #265.193(c)(3)	NO	I. See the Engineering Analysis. IIa. See Field Inspection Questionnaire. IIb. See Elec & Inst. CAS Data Sheets.	The existing device will not measure low leak rates due to its design. The wiring in the pits is not NEC code compliant. "SO" cords are not suitable for buried or conduit use. Wiring insulation is cracking in some terminal boxes.
AW.11.1.4	Liquid Temperature Sensor	3.2.1.1.1.17	PORD	YES	I. See the Engineering Analysis.	Although this device meets PORD requirements, it could be eliminated as redundant instr. as it adds little value to leak detection.

EXISTING TANK FARM EQUIPMENT FUNCTIONS ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS						
REF. NO	SYSTEM NAME	FUNCTION OR CONSTRAINT			METHOD OF ANALYSIS I. Analysis II. Inspection III. Testing	BRIEF REASON FOR DECISION
		DESCRIPTION	SOURCE	MET		
AW/II.2	ANNULUS LEAK INSTRUMENTATION	Secondary Containment Leak Detection	1. 40CFR-CH1-#265.193(c)(3), WAC-173-303	NO	I. See the Engineering Analysis.	Leakage from secondary tank walls may be absorbed in the soil. Secondary containment floor leaks may be detected by the Leak Detection Pit systems.
AW/II.2.1	Annulus CAM Radiation Monitoring Subsystem	3.2.1.1.1.17	PDRD, 40CFR-CH1-#265.193(c)(3), WAC-173-303	YES	I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	This system is too sensitive to Radon gas, which yields excessive false alarms. System beta/gamma sensitivity specification is somewhat arbitrary (see WHC-TI-357; 600 CMP = 3 * BASELINE). Maintenance/calibration of the analyzer is difficult because of lifting requirements. A partial upgrade may be appropriate. The data recorder requires extensive maintenance. Junction boxes are moderately corroded, will require replacement within the next 4-5 years. A Trade Study should be carried out to determine the efficiency of this type of instrument and the appropriateness of this application.
AW/II.2.2	Liquid Presence Sensor (Flake Box & Manual Tape Conductivity Probe)	3.2.1.1.1.17	1. PDRD, WAC-173-303-#150(d)(c)(iii), 40CFR-CH1-#265.193(c)(3)	NO	I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	The device is manually operated. Thus the level detected is subject to operator interpretation & the resolution is poor. Monitoring Frequency requirements suggest a need for automatic monitoring & recording. This device requires an Operator to enter the farm to operate. This device is a very large consumer of Inst. Air. This device housing is damaged by UV radiation. The basic Design is a problem.
AW/II.2.3	Annulus Pump Pit Liquid Presence Sensor	3.2.1.1.2.7	PDRD	NO	I. See the Engineering Analysis.	See AW/II.3.3

**EXISTING TANK FARM EQUIPMENT
FUNCTIONS ASSESSMENT TABLE**
INSTRUMENTS & CONTROL SYSTEMS

REF. NO	SYSTEM NAME	FUNCTION OR CONSTRAINT			METHOD OF ANALYSIS I. Analysis II. Inspection III. Testing	BRIEF REASON FOR DECISION
		DESCRIPTION	SOURCE	MET		
AW11.3	PIPELINE LEAK INSTRUMENTATION	3.2.1.1.2.7 Secondary Containment Leak Detection	PDRD WAC-173- 303#160(4)(c)(iii) 40CFR- CH1 #265.193(c)(3)	NO	I. See the Engineering Analysis.	The detection system cannot detect a failure of pipeline secondary containment. The detection system cannot detect a failure of the various "Transfer Pits". A Trade Study should pull together the various environment interpretations, permits and waiver request to confirm the need for this type of system.
AW11.3.1	C.O.B. Liquid Presence Sensor	3.2.1.1.2.7	PDRD WAC-173-303- #160(4)(c)(iii), 40CFR-CH1- #265.193(c)(3)	NO	I. See the Engineering Analysis. IIb. See Elec. CAS Data Sheets.	The existing sensor will not detect low leak rates due to its design. Its operability cannot be easily verified (manual drenching with water is required) and it cannot be tested function with existing electrical circuitry. The installation has NEC Code compliance issue. Existing wiring insulation is brittle and cracked. Current sensitive relays are not (& cannot be) calibrated with the sensor.
AW11.3.2	Pipeline Pressure Switch Sensor	3.2.1.1.2.10 3.2.1.3.4	PDRD	NO	I. See the Engineering Analysis.	Adequate "status of the route isolation" is not provided for all the transfer routes. This will require an Engineering analysis to determine if more pressure switches are required.

EXISTING TANK FARM EQUIPMENT FUNCTIONS ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS						
REF. NO	SYSTEM NAME	FUNCTION OR CONSTRAINT			METHOD OF ANALYSIS I. Analysis II. Inspection III. Testing	BRIEF REASON FOR DECISION
		DESCRIPTION	SOURCE	MET		
AW/11.3.3	Transfer Pits: Liquid Presence Sensor	3.2.1.1.2.7	PDRD WAC-173-303- #160(4)(c)(iii), 40CFR-Ch1 - #265.193(c)(3)	NO	I. See the Engineering Analysis. IIa. See Field Inspection Questionnaire. IIb. See Elec. CAS Data Sheets.	The pit sensor will not detect low leak rates due to its design. Its operability cannot be easily verified (manual drenching with water is required) and it cannot be tested function with existing electrical circuitry. Rain and melting snow infiltration through cover blocks are often causes of false alarms. The terminal boxes that house the field alarm lamps have had their NEMA rating ruined by incorrect modifications. Wiring inside the boxes has badly deteriorated insulation. The "SO" cord in use is not rated for buried or conduit applications. Current sensitive relays are not (& cannot be) calibrated with the sensor. In the central pump pit of tanks with flammable atmosphere, there is a concern that this system may be an ignition source. See AW/11.3.3
AW/11.3.5	Service Pit Instruments (LDE only)	3.2.1.1.2.7	PDRD	NO	See AW/11.3.3	
AW/11.4	PUMP PERMISSIVE INSTRUMENTATION (241-AW-271 Master Pump Shutdown Relay Panel)	3.2.1.1.2.9 3.2.1.1.2.10 3.2.1.3.10	PDRD	NO	I. See the Engineering Analysis.	The existing system does not allow interlock versatility. (Its all or nothing.) You can not set up a transfer route and have only the appropriate leak sensors for that route active.
AW/11.4.4	[242-A Relay Panel]	3.2.1.1.2.9 3.2.1.1.2.10 3.2.1.3.10	PDRD	NO	I. See the Engineering Analysis.	This system ties the East Area tank farms together and does not allow interlock versatility. (Its all or nothing.) You can not easily isolate farms for a waste transfer route and have only the appropriate leak sensors for that route active.

EXISTING TANK FARM EQUIPMENT FUNCTIONS ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS						
REF. NO	SYSTEM NAME	FUNCTION OR CONSTRAINT			METHOD OF ANALYSIS I. Analysis II. Inspection III. Testing	BRIEF REASON FOR DECISION
		DESCRIPTION	SOURCE	MET		
AW/11.5	LOCAL ALARM ANNUNCIATION & ALARM PANELS (241-AW-271 & 242-A)	3.2.1.1.2.2 3.2.1.1.2.3 3.2.1.1.2.4 3.2.1.1.2.5 3.2.1.1.2.13 3.2.1.1.3	PDRD	NO	I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	System indicators, in general, do not appear to comply with NUREG-0700 design guidelines which deal with alarm identification. Replacement of the leak detection & M.P.S. systems may render part of the old PANALARM non-functional. re: AW/11.3.4. The terminal boxes that house the field alarm lamps have had their NEMA function ruined by incorrect modifications. They are no longer weather tight and badly leak rainwater re: AW/11.5.3 This system relies on old (~ 17 yrs) Hanford designed communications equipment to interface to the CASS system. It is obsolete and parts procurement is difficult.
AW/11.6	REMOTE ALARM SIGNALING (GAMEWELL LOOP)	3.2.1.1.3	PDRD	NO	I. See the Engineering Analysis. IIa. See Field Inspection Questionnaire.	This Signaling system does not allow identification of individual leak sensing elements. The system has a long history of maintenance problems.
AW/11.7	TANK WASTE HIGH LEVEL ALARM SUBSYSTEM	3.2.1.1.1.5	PDRD	NO	I. See the Engineering Analysis.	Verification of the operability of these high level sensors is not reliable because of the design of the liquid presence sensor. These sensors can not be calibrated. In tanks with flammable atmosphere there is concern that this system may be an ignition source. Current sensitive relays are not (& cannot be) calibrated with the sensor.
AW/12	VENTILATION CONTROL SYSTEM					
AW/12.1	TANK PRIMARY VENTILATION SYSTEM					

**EXISTING TANK FARM EQUIPMENT
FUNCTIONS ASSESSMENT TABLE**
INSTRUMENTS & CONTROL SYSTEMS

REF. NO	SYSTEM NAME	FUNCTION OR CONSTRAINT			METHOD OF ANALYSIS I. Analysis II. Inspection III. Testing	BRIEF REASON FOR DECISION
		DESCRIPTION	SOURCE	MET		
AW/12.1.1	Tank Diff. Pressure Instr. Subsystem	3.2.1.1.1.33 3.2.1.1.1.34 3.2.1.1.1.35	PDRD	NO	I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	This equipment is obsolete and uses pneumatics to measure and transmit pressure data. The instrument air system has air quality problems which may cause unreliable performance. Future procurement of spare parts may be difficult because the technology is outdated. Old chart recorders have unreliable performance and do not connect to Electronic Database directly, thus record keeping requires handling paper strips. Archival of pressure data requires pasting into Supporting Documents. Automatic data acquisition should be considered. Renovation of the cabinet should be considered for upgrade work.
AW/12.1.2	HEPA Filter Diff. Pressure Instr.	3.2.1.2.9 3.2.3	PDRD	NO	I. See the Engineering Analysis.	Record keeping of filter degradation requires manual data gathering. No electronic database capability is available. Automatic data acquisition should be considered.
AW/12.1.3	Temperature Instrumentation	3.2.1.1.1.41 3.2.3	PDRD	NO	See below.	Record keeping of temperature data requires manual data gathering. No electronic database capability is available. Automatic data acquisition should be considered.
AW/12.1.4	Heater Control Subsystem	3.2.1.1.1.41	PDRD	NO	I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	Heater controls require extensive maintenance, and cannot be calibrated. Temperature probes have high failure rates. Automatic data acquisition should be considered.
AW/12.1.5	Fan-Motor Control Subsystem	3.2.1.2.9 3.2.1.2.10 3.2.3	PDRD	YES ¹	See HVAC assessment.	Automatic change over circuits do not operate correctly. Control circuits are in poor condition. ¹ Automatic data acquisition for control position should be considered.
AW/12.1.6	Damper Control Subsystem	3.2.1.2.10	PDRD	YES ¹	See HVAC assessment.	Damper actuators and linkages are in poor condition on K2-5-2 system. ¹ Automatic data acquisition for control position should be considered.

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AW.12.1.8	Regulated Stack Monitoring System	3.2.1.1.1.42 Inst. Sensitivity (DCG)	PDRD WHC-SD-EN-TI-288	NO	I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	System does not comply with WDOE requirements.
AW.12.2	TANK ANNULUS VENTILATION SYSTEM					(See HVAC section.)
AW.12.2.1	Annulus Diff. Pressure Inst. Subsystem	3.2.1.2.3.1	PDRD	NO	I. See the Engineering Analysis.	The existing system is manually read in the farm. The interaction between the primary ventilation system and the annular ventilation on the primary tank wall must be manually computed.
AW.13	TRANSFER LINE CONTROL SYSTEM	3.2.1.1.2.5 3.2.1.1.2.8	PDRD	NO	I. See the Engineering Analysis.	Effluents are not monitored.
AW.13.1	PUMP CONTROL SUBSYSTEM	3.2.1.1.2.9	PDRD	NO	I. See the Engineering Analysis.	Monitoring of Motive Force Devices is minimal, eg. no current monitoring is carried out.
AW.13.2	VALVE POSITION INSTRUMENTATION - INDICATION (No automation)	3.2.1.1.2.10	PDRD	NO	I. See the Engineering Analysis.	Electronic Feedback of route isolation status does not exist. Transfer route identification cannot be electronically verified because valve position is not remotely monitored. Limit switches are problematic, but new technology exists which could provide continuous position indication.
AW.13.3	VALVE CONTROL SYSTEM	3.2.1.1.2.10	PDRD	NO	I. See the Engineering Analysis.	MotORIZED valve control does not exist.
AW.13.4	PRESSURE SWITCH INSTRUMENTATION (Flow Indication)	3.2.1.1.2.9	PDRD	NO	I. See the Engineering Analysis.	Requirements for pipeline pressure sensor for monitoring misrouting is not clearly defined in the PDRD. Transfer route identification cannot be electronically verified because all pipelines are not monitored for pressure or flow.
AW.13.5	WASTE FLOW MONITORING INSTRUMENTATION (Service Pit & Flush Pit)	3.2.1.1.2.11	PDRD	NO	I. See the Engineering Analysis.	The PDRD should clarify the requirement for this data type.
AW.13.5.1	Service Pit Instrument Subsystems					Waste Flow Instrumentation, in general, does not exist. The PDRD should more clearly specify which pipelines should have this measurement function.
AW.13.5.1.1	Flow Monitor & Totalizer	3.2.1.1.2.11	PDRD	NO	I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	The flow totalizer cannot detect small flow rates (less than 5 gpm).
AW.13.5.1.2	Radiation (Gamma) Monitor					Not Assessed. The PDRD does not clearly require this function.
AW.13.5.1.3	Pipeline Pressure	3.2.1.1.2.9	PDRD		Relates to AW.13.4	Not Assessed.

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AW/12.1.8	Regulated Stack Monitoring System	3.2.1.1.1.4.2 Inst. Sensitivity (DCG)	PDRD WHC-SD-EN-TI-283	NO	I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	System does not comply with WDOE requirements.
AW/12.2	TANK ANNULUS VENTILATION SYSTEM					{See HVAC section.}
AW/12.2.1	Annulus Diff. Pressure Inst. Subsystem	3.2.1.2.3.1	PDRD	NO	I. See the Engineering Analysis.	The existing system is manually read in the farm. The interaction between the primary ventilation system and the annular ventilation on the primary tank wall must be manually computed.
AW/14	TANK CONTENTS MONITORING SYSTEM	3.2.1.1.2.6	PDRD	NO	I. See the Engineering Analysis.	In most cases, real time monitoring systems for these parameters do not exist, i.e viscosity, specific gravity, etc.
AW/14.1	TEMPERATURE/VAPOR INSTRUMENTATION	3.2.1.1.1.9 3.2.1.1.1.25 3.2.1.2.1.1.1	PDRD	NO	I. See the Engineering Analysis.	Temperature trees that do not have removable sensors are candidates for replacement. These types of Trees can not be repaired. All existing trees cannot withstand mixer pump forces.
AW/14.2	STANDARD HYDROGEN MONITORING SYSTEM	3.2.1.1.1.37	PDRD	YES	System is new. Not Assessed.	SHMS requires purge nitrogen. If the purge gas is switched to instrument air, there is an air quality issue.
AW/14.3	CHEMICAL COMPOSITION INSTRUMENTATION	3.2.1.1.1.1 3.2.1.1.1.2.1.1 3.2.1.1.1.2.1.2	PDRD	NO	I. See the Engineering Analysis.	A real time chemical analyzer does not exist. This is a manual sampling effort, analysis is by laboratory & is infrequently done. The PDRD should clarify the requirement for this type of system. Specific Gravity Inst. is only installed in AW-102. No SpG Inst. are installed in 101, 103-106.
AW/14.3.1	102-AW SPECIFIC GRAVITY INSTRUMENTATION	3.2.1.1.1.2.1.2	PDRD	NO	I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	This equipment is obsolete. Acquisition of spare parts in the future may be difficult. Future Manufacture support for these types of instrumentation is uncertain. This system utilizes instrument air. Instrument air quality is an issue. Density is not measured directly, but is calculated from air pressure measurements. This complicates the calibration function and the device may not read accurately. The PDRD should reassess the need for this real-time monitoring system for any all tanks.

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AW.12.1.8	Regulated Stack Monitoring System	3.2.1.1.1.4.2 Inst. Sensitivity (DCG)	PDRD WHC-SD-EN-TI-288	NO	I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	System does not comply with WDOE requirements.
AW.12.2	TANK ANNULUS VENTILATION SYSTEM					(See HVAC section.)
AW.12.2.1	Annulus Diff. Pressure Inst. Subsystem	3.2.1.2.3.1	PDRD	NO	I. See the Engineering Analysis.	The existing system is manually read in the farm. The interaction between the primary ventilation system and the annular ventilation on the primary tank wall must be manually computed.
AW.14.4	TANK LIQUID SURFACE LEVEL INSTRUMENTATION (Enraf is scheduled to be installed in this farm soon.)	3.2.1.1.1.5 3.2.1.1.1.13 3.2.1.1.2.12	PDRD	NO	I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	This device must satisfy the need for Mass Balance & Tank Inventory measurements. This device is used to detect/confirm liquid leaks and liquid intrusions. The existing FIC gauges achieve poor resolution and require extensive maintenance. The AW T.F. level gauges are partially inoperative apparently because the cable is disconnected in A farm. The Enraf device was not assessed at this time. However, the Enraf CIU will be required to send digital data directly to TMACS Central in order to remotely report a full range (top level in tank to bottom of tank).
W.14.5	SLUDGE WEIGHT (LEVEL) MONITORING	3.2.1.1.1.1	PDRD	YES	I. See the Engineering Analysis.	This device is expensive to fabricate. It requires an Operator to enter the farm to operate. The level data obtained is subject to Operator interpretation and the resolution is poor. A Trade Study should determine if this device should be automated.
AW.15	TANK CONTENTS MIXING SYSTEMS	Not in PDRD			I. See the Engineering Analysis.	This function is missing from the PDRD and should be added.
AW.15.1	AIR LIFT CIRCULATOR CONTROL SYSTEM					
AW.15.1.1	DIFF. PRESSURE SENSORS				I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	These sensors are manually read. A Trade Study should determine if the data acquisition should be automated.

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AW.12.1.8	Regulated Stack Monitoring System	3.2.1.1.1.4.2 Inst. Sensitivity (DCG)	PDRD WHC-SD-EN-TI-288	NO	I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	System does not comply with WDOE requirements.
AW.12.2	TANK ANNULUS VENTILATION SYSTEM					(See HVAC section.)
AW.12.2.1	Annulus Diff. Pressure Inst. Subsystem	3.2.1.2.3.1	PDRD	NO	I. See the Engineering Analysis.	The existing system is manually read in the farm. The interaction between the primary ventilation system and the annular ventilation on the primary tank wall must be manually computed.
AW.16	SCC STATUS/MONITORING SYSTEM AC POWER SUPPLY STATUS AIR SUPPLY STATUS WATER SUPPLY STATUS HEAT TRACE SYS. STATUS CATHODIC PROT. SYS. STATUS Other	3.2.1.1.2.1 3.2.1.1.2.3	PDRD	NO	I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	A status summary alarm panel for all these subsystems doesn't exist. Some status are available on the old PANALARM panels. Some of the data is obtained by Operator rounds. Replacement of the various instrument systems may render much of the old PANALARM non-functional.
AW.16.4	TANK CONCRETE STRUCTURE TEMPERATURE INST.	3.2.1.1.1.29 3.2.1.2.1.1.2	PDRD	NO	I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	The data loggers are obsolete. Spare parts procurement are problem. The new TMACS design for AW farm will provide some monitoring of these Thermocouples. The PDRD should specify which thermocouples require real-time monitoring.
AW.17	HEAT TRACE CONTROL SYSTEM	3.2.1.3	PDRD	NO	I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	Some of the Transfer Lines have broken heat traces. The PDRD should reassess the need for this system.
AW.18	CATHODIC PROTECTION SYSTEM	3.2.1.3.5 Testing requirement	PDRD WAC-173-303#640	NO ¹	I. See the Engineering Analysis.	The existing system doesn't seem to comply with the testing capability requirements for cathodic protection systems i.a.w. WAC. ¹ A partial upgrade may be appropriate.

5.3 Architecture Tree Tables

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Level 4

Level 2

Level 3

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Level 5

Level 2

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Level 5

Level 2

Level 3

Level 4

Level 2

LEAK CONTROL
SYSTEM
AW.11

Level 3

ANNULUS LEAK
INSTRUMENTATION
AW.11.2

Level 4

CAM Radiation
Monitoring
Subsystem
AW.11.2.1
3 vent pits, 2 CAMs
per pit

Level 5

Air Sampler
Probe/Tubing/etc
AW.11.2.1.1

Radiation
Analyzer
AW.11.2.1.2

Cabinet
(Vent. Pit)
AW.11.2.1.3

3-Pen Recorder
& Alarms
(241-AW-271)
AW.11.2.1.4

Signal
Wiring/Conduit
AW.11.2.1.5

Level 2

LEAK CONTROL
SYSTEM
AW.11

Level 3

PIPELINE LEAK
INSTRUMENTATION
AW.11.3

Level 4

C.O.B.
Liquid Presence
Sensor
AW.11.3.1

Pipeline
Pressure Switch
Sensor
AW.11.3.2

Transfer Pit
Leak Detection
Instruments
AW.11.3.3

Field Signal
Wiring/Conduit/
Terminal Boxes
AW.11.3.4

Feed Pump Pits
Valve Pits
Central Pump Pits
Flush Pit
Drain Pit
Annulus Pump Pit
Service Pit

Level 2

LEAK CONTROL
SYSTEM
AW.11

Level 3

PIPELINE LEAK
INSTRUMENTATION
AW.11.3

Level 4

Transfer Pit
Instrumentation
AW.11.3.3

Level 5

Pit
Liquid Presence
Sensor
AW.11.3.3.1

Pit
Control Station
AW.11.3.3.2

Pit Signal
Wiring/Conduit/
Terminal Boxes
AW.11.3.3.3

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Level 3

Level 4

Level 2

Level 3

Level 4

Level 2

Level 3

Level 2

VENTILATION
CONTROL SYSTEM
AW.12

Level 3

TANK PRIMARY
VENTILATION
SYSTEM
AW.12.1

Level 4

Tank
Diff. Pressure
Inst. Subsystem
AW.12.1.1

HEPA Filter
Diff. Pressure
Instrumentation
AW.12.1.2

Temperature
Instrumentation
AW.12.1.3

Heater
Control
System
12.1.4

Fan - Motor
Control
System
AW.12.1.5

Level 4

Damper
Control
Subsystem
AW.12.1.6

Moisture
Monitoring
System
AW.12.1.7

Regulated Stack
Monitoring
System
AW.12.1.8

Level 2

Level 3

Level 4

Level 5

Level 2

Level 3

Level 4

Level 5

Level 2

Level 3

Level 2

Level 2

Level 3

Level 4

Level 2

Level 3

Level 4

Level 2

Level 3

Level 4

Level 2

LEAK CONTROL
SYSTEM
AW.11

Level 3

CHEMICAL COMPOSITION
MONITORING
INSTRUMENTATION
AW.14.3

Level 4

102-AW
Specific Gravity
Instrumentation
AW.14.3.1

Level 5

Sample Tubes
(Leak Det. Pit)
AW.14.3.1.1

Weight Factor &
Specific Gravity
Pressure Sensors
AW.14.3.1.2

Weight Factor
Cabinet
AW.14.3.1.3

reserved

W.F. & SpG
Press. Switches
& Indicators
(Inst. Panel)
AW.14.3.1.5

Level 2

Level 3

Level 4

Level 2

Level 3

Level 2

TANK CONTENTS
MIXING CONTROL
SYSTEMS
AW.15

Level 3

AIR LIFT
CIRCULATOR
CONTROL SYSTEM
AW.15.1

Level 4

Diff. Pressure
Sensors
AW.15.1.1

Local
Indication
AW.15.1.2

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Level 3

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Level 2

Level 3

Level 2

5.4 Drawing Reference Tables

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EXISTING TANK FARM EQUIPMENT SYSTEM DRAWING REFERENCES INSTRUMENTS & CONTROL SYSTEMS				
REF NO.	SYSTEM NAME	DRAWING REFERENCES	NO. OF ECNs OUTSTANDING	PDRD REFERENCE
AW/11	LEAK CONTROL SYSTEM	H-14-020602 (H-2-70348, 70349, 70350), H-14-020502	0	1. 3.2.1.1.2.4
AW/11.1	LEAK DET. PIT/SUMP INST.	H-14-020502 (H-2-70348, 70349, 70350)	0	
AW/11.1.1	Gamma Radiation Monitoring Subsystem	H-14-020502 (H-2-70348, 70349, 70350)	0	1. 3.2.1.1.1.17
AW/11.1.1.1	Gamma Probe Well Structure	H-2-70310	0	
AW/11.1.1.2	Gamma Probe & Well Cable	H-14-020502 (H-2-70348, 70349, 70350)	0	
AW/11.1.1.3	Field Signal Cable	H-2-70330	0	
AW/11.1.1.4	reserved			
AW/11.1.1.5	Count Rate Meters/ Alarm Comparators.	H-2-70359, H-2-70365	0	
AW/11.1.2	Weight Factor & Specific Gravity Monitoring Subsystem	H-14-020502 (H-2-70348, 70349, 70350)	0	1. 3.2.1.1.1.17
AW/11.1.2.1	Sample Tubes (Leak Det. Pit)	H-2-70356, H-2-70352	6	
AW/11.1.2.2	Weight Factor & Specific Gravity Pressure Sensors	H-2-70325, H-14-020602 (H-2-70348, 70349, 70350)	0	
AW/11.1.2.3	Weight Factor Cabinet (Xmitter Enclosure)	H-2-70352, H-14-020602 (H-2-70348, 70349, 70350)	2	
AW/11.1.2.4	Field Tubing	H-2-70352.	2	
AW/11.1.2.5	W.F. & SpG Pressure Switches & Indicators (Inst. Panel & Press. SW Rack)	H-2-70359, H-2-70363, H-2-70325	1	
AW/11.1.3	Liquid Presence Sensor and Buried wiring			1. 3.2.1.1.1.17
AW/11.1.4	Liquid Temperature Sensor	H-14-020502 (H-2-70348, 70349, 70350)	0	1. 3.2.1.1.1.17
AW/11.2	ANNULUS LEAK INSTRUMENTATION	H-14-020502 (H-2-70348, 70349, 70350)	0	1. Secondary Containment Leak Detection
AW/11.2.1	Annulus CAM Radiation Monitoring Subsystem	H-2-70336, H-2-70357, H-2-74897	6	1. 3.2.1.1.1.17
AW/11.2.1.1	Air Sampler Probe/ Tubing/ etc	H-2-70357	4	
AW/11.2.1.2	Radiation Analyzer	H-2-70357	4	

EXISTING TANK FARM EQUIPMENT SYSTEM DRAWING REFERENCES INSTRUMENTS & CONTROL SYSTEMS				
REF NO.	SYSTEM NAME	DRAWING REFERENCES	NO. OF ECNs OUTSTANDING	PRDR REFERENCE
AW/11.2.1.3	Cabinet (Vent. Pit)	H-2-70357	4	
AW/11.2.1.4	3-Pen Recorder & Alarms (241-AW-271)	H-2-70359, H-2-70363	1	
AW/11.2.1.5	Signal Wiring/ Conduit	H-2-74897	2	
AW/11.2.2	Liquid Presence Sensor (Flake Box & Manual Tape Conductivity Probe)	H-2-70345, H-2-70354	1	1. 3.2.1.1.1.17
AW/11.2.3	Annulus Pump Pit Liquid Presence Sensor	H-2-72030	0	
AW/11.3	PIPELINE LEAK INSTRUMENTATION	H-2-70328	0	1. 3.2.1.1.2.7 2. Secondary Containment Leak Detection
AW/11.3.1	C.O.B. Liquid Presence Sensor	H-2-34965	0	1. 3.2.1.1.2.7
AW/11.3.2	Pipeline Pressure Switch Sensor			1. 3.2.1.1.2.10 2. 3.2.1.3.4
AW/11.3.3	Transfer Pits: Liquid Presence Sensor	H-2-72030	0	1. 3.2.1.1.2.7
AW/11.3.3.1	Pit Liquid Presence Sensor	H-2-72030	0	
AW/11.3.3.3	Pit Pressure Switch Sensor			
AW/11.3.3.3	Pit Signal Wiring/Conduit/Terminal Boxes	H-2-70328	0	
AW/11.3.4	Field Signal Wiring/ Conduit/ Terminal Boxes	H-2-70328, H-2-34965	0	
AW/11.3.5	Service Pit Instruments (LDE only)	H-2-70387	0	
AW/11.4	PUMP PERMISSIVE INSTRUMENTATION (Master Pump shutdown)	H-2-70325	0	1. 3.2.1.1.2.9 2. 3.2.1.1.2.10 3. 3.2.1.3.10
AW/11.4.1	241-AW-271 Master Pump Shutdown Relay Panel	H-2-70325	0	1. 3.2.1.1.2.9 2. 3.2.1.1.2.10 3. 3.2.1.3.10
AW/11.4.2	MPS Pushbutton Control Panel			
AW/11.4.3	Signal/Wiring/Conduit/TBX	H-2-70330	0	

EXISTING TANK FARM EQUIPMENT SYSTEM DRAWING REFERENCES INSTRUMENTS & CONTROL SYSTEMS				
REF NO.	SYSTEM NAME	DRAWING REFERENCES	NO. OF ECNs OUTSTANDING	PDRD REFERENCE
AW/J1.4.4	[242-A Relay Panel]			
AW/J1.5	LOCAL ALARM ANNUNCIATION & ALARM PANELS	H-14-020602 (H-2-70348, 70349, 70350), H-14-020602	0	1. 3.2.1.1.2.2 2. 3.2.1.1.2.3 3. 3.2.1.1.2.4 4. 3.2.1.1.2.5 5. 3.2.1.1.2.13 6. 3.2.1.1.3
AW/J1.5.1	Alarm Panel (241-AW-271)	H-2-70362, H-2-70359, H-2-70363	1	
AW/J1.5.2	Tank Farm Alarm Panel	H-2-70362, H-2-70359, H-2-70363	1	
AW/J1.5.3	CASS Alarm Panel Interface	H-2-71550	0	
AW/J1.6	REMOTE ALARM SIGNALING (GAMEWELL LOOP)	H-2-71804, H-2-71805	0	3.2.1.1.3
AW/J1.7	TANK WASTE HIGH LEVEL ALARM SUBSYSTEM	H-14-020602 (H-2-70348, 70349, 70350), H-2-70331	0	
AW/J1.7.1	Waste Liquid High Level Probe	H-2-70331	0	
AW/J1.7.2	Tank Farm alarm Panels (Current Sensitive Relays)	H-2-70331	0	
AW/J1.7.3	Wiring/Conduit/TBX	H-2-70330	0	
AW/J2	VENTILATION CONTROL SYSTEM	H-2-70336	0	
AW/J2.1	TANK PRIMARY VENTILATION SYSTEM	H-2-70336, H-2-90905	0	
AW/J2.1.1	Tank Diff. Pressure Inst. Subsystem	H-14-020602 (H-2-70348, 70349, 70350)	0	1. 3.2.1.1.1.33 2. 3.2.1.1.1.34 3. 3.2.1.1.1.35
AW/J2.1.1.1	Tank Riser Tubing to Pressure Sensor/Transmitter	H-2-70352	2	
AW/J2.1.1.2	Pressure Sensor/Transmitter	H-2-70352	2	
AW/J2.1.1.3	Field Instrument Air Tubing	H-2-70352	2	
AW/J2.1.1.4	Pressure Switch/Alarm	H-2-70370	7	
AW/J2.1.1.5	2-Pen Pressure Recorder (241-AW-271)	H-2-70359, H-2-70363	1	

EXISTING TANK FARM EQUIPMENT SYSTEM DRAWING REFERENCES INSTRUMENTS & CONTROL SYSTEMS				
REF NO.	SYSTEM NAME	DRAWING REFERENCES	NO. OF ECNs OUTSTANDING	PDRD REFERENCE
AW.12.1.2	HEPA Filter Diff. Pressure Instr.	H-2-90905	0	
AW.12.1.3	Temperature Instrumentation	H-2-90905	0	1. 3.2.1.1.1.4.1
AW.12.1.4	Heater Control Subsystem	H-2-92166	0	
AW.12.1.5	Fan-Motor Control Subsystem	H-2-70325	0	
AW.12.1.6	Damper Control Subsystem	N/A - MANUAL		
AW.12.1.7	Moisture Monitoring Subsystem			3.2.1.1.1.4.2
AW.12.1.8	Regulated Stack Monitoring System (296-A-27)	H-2-90905, H-2-92495, H-2-74896, H-2-92520	4	1. 3.2.1.1.1.4.2
AW.12.1.8.1	<i>Tubing from Stack to CAM</i>	H-2-78496	0	
AW.12.1.8.2	<i>CAMs (Radiation Analyzers)</i>	H-2-92520	4	
AW.12.1.8.3	<i>CAM Cabinets</i>	H-2-92520	4	
AW.12.1.8.4	<i>Vacuum Pumps</i>	H-2-92520	4	
AW.12.1.8.5	<i>? Pen Recorder (242-A)</i>	H-2-70359	0	
AW.12.2	TANK ANNULUS VENTILATION SYSTEM	H-2-70336, H-2-70325	0	
AW.12.2.1	Annulus Diff. Pressure Inst. Subsystem	H-2-70336	0	3.2.1.2.3.1
AW.13	TRANSFER LINE CONTROL SYSTEM			1. 3.2.1.1.2.5 2. 3.2.1.1.2.8
AW.13.1	PUMP CONTROL SUBSYSTEM	H-2-70325	0	1. 3.2.1.1.2.9
AW.13.2	VALVE POSITION INSTRUMENTATION - INDICATION (No automation)	N/A - MANUAL		1. 3.2.1.1.2.10
AW.13.3	VALVE CONTROL SYSTEM	N/A - MANUAL		1. 3.2.1.1.2.10
AW.13.4	PRESSURE SWITCH INSTRUMENTATION (Flow Indication)	N/A		1. 3.2.1.1.2.9
AW.13.5	WASTE FLOW MONITORING INSTRUMENTATION (Service Pft & Flush Pft)	H-2-70387, H-2-70331	0	1. 3.2.1.1.2.11

EXISTING TANK FARM EQUIPMENT SYSTEM DRAWING REFERENCES INSTRUMENTS & CONTROL SYSTEMS				
REF NO.	SYSTEM NAME	DRAWING REFERENCES	NO. OF ECNs OUTSTANDING	PDRD REFERENCE
AW/13.5.1	Service Pt Instrument Subsystems	H-2-70387, H-2-70331	0	
AW/13.5.1.1	Flow Monitor & Totalizer	H-2-70387, H-2-70331	0	
AW/13.5.1.2	Radiation (Gamma) Monitor	H-2-70387	0	
AW/13.5.1.3	Pipeline Pressure	H-2-70387	0	
AW/14	TANK CONTENTS MONITORING SYSTEM	H-14-020602 (H-2-70348, 70349, 70350), H-14-020602	0	1. 3.2.1.1.2.6
AW/14.1	TEMPERATURE/VAPOR INSTRUMENTATION	H-14-020602 (H-2-70348, 70349, 70350), H-14-020602, H-2-70365	0	1. 3.2.1.1.1.9 2. 3.2.1.1.1.25 3. 3.2.1.2.1.1.1
AW/14.1.1	Thermocouple Probes	H-14-020602 (H-2-70348, 70349, 70350), H-2-70365	0	
AW/14.1.2	Multifunction Instrument Tree			
AW/14.1.3	Temperature Vapor Probes			
AW/14.2	STANDARD HYDROGEN MONITORING SYSTEM	H-2-87275	9	1. 3.2.1.1.1.37
AW/14.2.1	Gas Flow Instrumentation	H-2-817851, H-2-817853	2	
AW/14.2.2	H ₂ Concentration - Low range Instrumentation	H-2-817851, H-2-817853	2	
AW/14.2.3	H ₂ Concentration - High range Instrumentation	H-2-817851, H-2-817853	2	
AW/14.2.4	Gas Temperature Instrumentation	H-2-817851, H-2-817853	2	
AW/14.2.5	3 Pen Recorder	H-2-817851, H-2-817853	2	
AW/14.3	CHEMICAL COMPOSITION INSTRUMENTATION			1. 3.2.1.1.1.1 2. 3.2.1.1.1.2.1.1 3. 3.2.1.1.1.2.1.2
AW/14.3.1	102-AW-SPECIFIC GRAVITY INSTRUMENTATION	H-2-70349	1	1. 3.2.1.1.1.2.1.2
AW/14.4	TANK LIQUID SURFACE LEVEL INSTRUMENTATION (Enraf is scheduled to be installed in this farm soon.)	H-14-020602 (H-2-70348, 70349, 70350), H-2-70331, H-2-36382 (FC), H-2-817634 (Enraf)	45	1. 3.2.1.1.1.5 2. 3.2.1.1.1.13 3. 3.2.1.1.2.1.2

EXISTING TANK FARM EQUIPMENT SYSTEM DRAWING REFERENCES INSTRUMENTS & CONTROL SYSTEMS				
REF. NO.	SYSTEM NAME	DRAWING REFERENCES	NO. OF ECNs OUTSTANDING	PDRD REFERENCE
AW/I4.4.1	FIC Riser Extension (Enraf Riser Extension)	H-2-817634 (Enraf), H-2-36382 (FIC)	45	
AW/I4.4.2	FIC Level Sensor (Enraf Bouancy-Tension Sensor)	H-2-817634 (Enraf), H-2-36382 (FIC)	45	
AW/I4.4.4	FIC Buried Signal Cable	H-2-70330	0	
AW/I4.4.4	Terminal Boxes (Enraf Signal Cables)	H-2-817634 (Enraf), H-2-36378, H-2-36382 (FIC)	48	
AW/I4.4.5	(Enraf Digital Interface)	H-2-817634 (Enraf)	21	
AW/I4.5	SLUDGE WEIGHT (LEVEL) MONITORING	H-14-020602 (H-2-70348, 70349, 70350)	0	
AW/I5	TANK CONTENTS MIXING SYSTEMS			
AW/I5.1	AIR LIFT CIRCULATOR CONTROL SYSTEM	H-2-70351, H-2-70389	1	
AW/I5.1.1	DIFF. PRESSURE SENSORS	H-2-70325	0	
AW/I5.1.2	LOCAL ALARM INDICATION	H-2-70325	0	
AW/I6	SCC STATUS/MONITORING SYSTEM			1. 3.2.1.1.2.1 2. 3.2.1.1.2.3
AW/I6.1	AC POWER SUPPLY STATUS INST.	H-2-70322 (NOTE - NO REMOTE INDICATION)	0	
AW/I6.2	AIR SUPPLY STATUS INST.	H-2-79872	2	
AW/I6.3	WATER SUPPLY STATUS INST.	H-2-70387	0	
AW/I6.4	TANK CONCRETE STRUCTURE TEMPERATURE INST.	H-14-020502 (H-2-70348, 70349, 70350), H-2-70365, H-2-70347	0	1. 3.2.1.1.1.29 2. 3.2.1.2.1.2
AW/I6.4.1	Data Logger (See CASS Assessment)	H-2-70359, H-2-70360	0	
AW/I6.4.2	Manual Readout Panel	H-2-70359, H-2-70363	1	
AW/I6.4.3	Signal Wiring/Terminal Boxes	H 2 70330	0	
AW/I6.5	HEAT TRACE SYSTEM STATUS INST.	H-2-70326	0	
AW/I6.6	CATHODIC PROTECTION SYSTEM STATUS INST.	H-2-90277, H-2-77120	0	

EXISTING TANK FARM EQUIPMENT SYSTEM DRAWING REFERENCES INSTRUMENTS & CONTROL SYSTEMS				
REF NO.	SYSTEM NAME	DRAWING REFERENCES	NO. OF ECNs OUTSTANDING	PDRD REFERENCE
AW/17	HEAT TRACE CONTROL SYSTEM	H-2-70326	0	1. 3.2.1.3
AW/17.1	TEMPERATURE MONITORING SENSORS	H-2-70326	0	
AW/17.2	TEMP. CONTROLLER SUBSYSTEM	H-2-70327	0	
AW/17.3	OVER TEMP. CONTROLLER SUBSYSTEM	H-2-70327	0	
AW/17.4	HEATER CONTACTOR - OTHER WIRING	H-2-70326	0	
AW/17.5	PIPELINE HEAT TRACE TAPE HEATER	H-2-70326	0	
AW/18	CATHODIC PROTECTION SYSTEM	H-2-90277, H-2-77120	0	1. 3.2.1.3.5 2. Testing requirement
AW/18.1	POWER CONTROLLER	H-2-90277, H-2-77120	0	
AW/18.2	SIGNAL WIRING/CONDUIT	H-2-90277, H-2-77120	0	

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5.5 Special Testing

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5.6 Field Assessment Questionnaire

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EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT QUESTIONNAIRE INSTRUMENTS & CONTROL SYSTEMS				
REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS		FINDINGS - COMMENTS
		DESCRIPTION		
AW/11	LEAK CONTROL SYSTEM			
AW/11.1	LEAK DET. PUMP/SUMP INST.			
AW/11.1.1	Gamma Radiation Monitoring Subsystem			
AW/11.1.1.1	Gamma Probe Well Structure	1. Verify water intrusion.		1) Metal cover plate is not sealed and does leak water, however the majority of water accumulation is caused by condensation.
AW/11.1.1.2	Gamma Probe & Well Cable	1. Inspect Cable at Instrument Well TBX. Sensor connector and cable are sometimes underwater. System is not designed for submerged use. Estimate cable life expectancy.		1) Cable is RG59 coaxial. Although the cable is sealed with RTV, I&C technicians indicate that cable failure at the connections is constant problem.
AW/11.1.1.3	Buried Field Signal Cable	1. Inspect Cable at Instrument Well TBX Estimate cable life expectancy.		
AW/11.1.1.4	Terminal Boxes	1. Inspect TBX for corrosion		
AW/11.1.1.5	Count Rate Meters/ Alarm comparators.	1. Estimate age of equipment 2. Recent Maint. Freq. of repair. 3. Estimate calibration capability. 4. Known problems. 5. Take several photographs of the meters and comparators.		1) Estimated age of equipment is 15 years 2) Low repair rate 3) Calibration on 6 month rotation, performed in the shop at 4 hours per instrument. 4) No recurrent problems
AW/11.1.2	Weight Factor Monitoring Subsystem	This is old technology and uses instrument air. What is the quality of the Instrument Air Supply ?		1) The quality of the instrument air in AW farm is not monitored, however the I&C technician suspects that moisture content is excessive.
AW/11.1.2.1	Sample Tubes (Leak Det. Ppt)	1. Inspect tube at WF enclosure. Life expectancy data needed.		1) Access not allowed at this time
AW/11.1.2.2	Weight Factor Pressure Sensors	1. Estimate age of equipment 2. Recent Maint. Freq. of repair. 3. Estimate calibration capability. 4. Known problems. 5. Take several Photographs of the inside of the cabinet.		1) Estimated age of equipment is 15 years 2) Low repair rate 3) Calibration on annual rotation, performed in the field at 1 hour per instrument. 4) No recurrent problems
AW/11.1.2.3	Weight Factor Cabinet (Xmitter Enclosure)	1. Inspect for corrosion.		1) Cabinet doors do not seal properly allowing dirt to infiltrate the cabinet.
AW/11.1.2.4	Field Tubing	1. Inspect for corrosion. Tubing will be inspected where it emerges in the cabinet. Life expectancy data needed.)		1) Copper tubing entering the instrument panels in 241AW has no indication of damage or corrosion. Estimated life of copper tubing is 10 years. There are indications of moderate to severe corrosion where the steel pipe is stubbed out and transitions to copper. Estimated life of the buried steel pipe is 5 years.

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT QUESTIONNAIRE INSTRUMENTS & CONTROL SYSTEMS				
REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS		FINDINGS - COMMENTS
		DESCRIPTION		
AW/11.1.2.5	W.F. Pressure Switches/ Alarms Cabinet	1. Estimate age of equipment 2. Recent Maint. Freq. of repair. 3. Estimate calibration capability. 4. Known problems. 5. Photograph the Pressure Sw rack.		1) Estimated age of equipment is 15 years 2) Low repair rate 3) Calibration on annual rotation, performed in the field at 1 hour per instrument. 4) No recurrent problems
AW/11.1.3	Liquid Presence Sensor and Buried wiring	1. Inspect 120 VAC wiring for Code compliance.		1) Access not allowed at this time
AW/11.1.4	Liquid Temperature Sensor	1. Estimate age of equipment 2. Recent Maint. Freq. of repair. 3. Estimate calibration capability. 4. Known problems.		1) Access not allowed at this time
AW/11.2	ANNULUS LEAK INSTRUMENTATION			
AW/11.2.1	CAM Radiation Monitoring Subsystem			
AW/11.2.1.1	Air Sampler Probe/ Tubing/ etc	1. Inspect visible parts for corrosion.		1) Probe could not be accessed at this time. Tubing has no signs of corrosion or damage.
AW/11.2.1.2	Radiation Analyzer	1. Estimate age of equipment 2. Recent Maint. Freq. of repair. 3. Estimate calibration capability. 4. Known problems. 5. Take several photographs of the inside of the cabinet.		1) Estimated age of equipment is 15 years 2) Low repair rate 3) Calibration is on an annual rotation, performed in the shop at 4 hours per instrument. 4) The CAMS weigh in excess of 100 pounds and are hard to access for removal from the cabinets for maintenance or calibration.
AW/11.2.1.3	Cabinet (Vent. Pti)	1. Inspect for corrosion.		1) Access not allowed at this time
AW/11.2.1.4	3-Pen recorder & Alarms	1. Estimate age of equipment 2. Recent Maint. Freq. of repair. 3. Estimate calibration capability. 4. Known problems. 5. Photograph the recorder.		1) Estimated age of equipment is 15 years 2) Continual repair action required 3) Calibration is on an annual rotation, performed in the field at 1 hour per instrument. 4) Continual repair action is required and equipment often requires extensive repairs to bring it within calibration tolerances.
AW/11.2.1.5	Signal Wiring/ Conduit	1. Inspect wiring where visible. Estimate cable life expectancy.		1) Signal wiring could not be accessed at this time. The conduit that could be viewed is in good condition, although most of the junction boxes were that were located on the exhaust fans were moderately corroded and should be replaced within the next 4 years.

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT QUESTIONNAIRE INSTRUMENTS & CONTROL SYSTEMS				
REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS		FINDINGS - COMMENTS
		DESCRIPTION		
AW/11.2.2	Liquid Presence Sensor (Flake Box & Manual Tape)	1. Estimate age of equipment 2. Recent Maint. Freq. of repair. 3. Estimate calibration capability. 4. Known problems. 5. Photograph the Flake box.		1) Estimated age of equipment is 15 years 2) Low repair rate 3) No calibration is performed. A functional test is performed monthly. 4) Terminal boxes exhibited a presence of condensation at all of the Flake boxes. O-ring seals are frequently replaced. A large volume of purge air is used at each Flake box.
AW/11.3	PIPELINE LEAK INSTRUMENTATION			
AW/11.3.1	C.O.B. Liquid Presence Sensor	1. If possible, video tape one LDE unit in a C.O.B. 3. Determine method of calibration.		1) Access not allowed at this time
AW/11.3.2	Pipeline Pressure Switch Sensor	Ignore for now.		N/A
AW/11.3.3	Transfer Pit Instruments	1. Video Tape top of Pit Cover Block. Concentrate on Cracks which leak in water.		
AW/11.3.3.1	Pit Liquid Presence Sensor	1. If possible, video tape one LDE unit in one (or both) Valve Pit(s). Verify, if possible: Rain and melting snow infiltration are often causes of false alarms.		1) Access not allowed at this time
AW/11.3.3.2	Pit Pressure Switch	1. If possible, video tape the inside of the Service Pit.		1) Access not allowed at this time
AW/11.3.4	Signal Wiring/ Conduit/ Terminal Boxes	1. Inspect 120 VAC Wiring at two (or more) TBX where the SO cord is terminated for Code compliance. 2. Estimate calibration capability of "current sensitive relays". 3. Photograph a few TBX, SO cord installations and "current sensitive relays".		1)Wiring at terminal boxes in the 241AW farms is in disrepair. Wire insulation is brittle and cracked. 2) Current sensitive relays are not calibrated. Functional tests are performed by the electricians and relays are replaced as they fail.
AW/11.6	PUMP PERMISSIVE INSTRUMENTATION			
AW/11.6.1	241-AW-271 Master Pump Shutdown Relay Panel	1. Inspect 120 VAC Wiring for NEC compliance. 2. Estimate age of equipment 3. Recent Maint. Freq. of repair. 4. Known problems. 5. Photograph the relays inside of the cabinet.		1) Wiring is in good condition within relay panel inside 271 building. 2) Estimated age of equipment is 15 years 3) Maintenance history could not be obtained at this time. 4) No known recurrent problems
AW/11.6.2	MPS Pushbutton Control Panel	1. Inspect for damage, etc. 2. Photograph the panel.		N/A
AW/11.7	LOCAL ALARM ANNUNCIATION & ALARM PANELS			

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT QUESTIONNAIRE INSTRUMENTS & CONTROL SYSTEMS				
REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS		FINDINGS - COMMENTS
		DESCRIPTION		
AW/11.7.1	Alarm Panel (241-AW-271)	1. Inspect 120 VAC wiring on rear of panel for NEC compliance. 2. Take several photographs of the front & rear of the panel.		1) Wiring is in good condition within building 271. No noted deficiencies.
AW/11.7.2	Alarm Panel CASS Interface	1. Make inspection of interface equipment. 2. Take several photographs of the equipment.		1) Access not allowed at this time
AW/11.7.3	Farm Alarm Panel	1. Inspect the Leak Alarm Lamp and Panel in the Farm. 2. Take a few photographs of the alarm panel.		1) Access not allowed at this time
AW/11.8	REMOTE ALARM SIGNALING (GAMEWELL LOOP)	1. Take a few photographs of the RAT.		1) Access not allowed at this time
AW/12	VENTILATION CONTROL SYSTEM			
AW/12.1	TANK PRIMARY VENTILATION SYSTEM			
AW/12.1.1	Tank Diff. Pressure Inst. Subsystem			
AW/12.1.1.1	Tank Riser Tubing to Pressure Sensor/Transmitter	1. Inspect tubing for corrosion. Tubing will be inspected where it emerges in the cabinet. Estimate life expectancy.		1) Access not allowed
AW/12.1.1.2	Pressure Sensor/Transmitter	1. Estimate age of equipment 2. Recent Maint. Freq. of repair. 3. Estimate calibration capability. 4. Known problems. 5. Take several Photographs of the inside of the cabinet.		1) Estimated age of equipment is 15 years 3) Calibration is on an annual rotation, performed in the field at 1 hour per instrument.
AW/12.1.1.3	Field Instrument Air Tubing to AW-271	1. Inspect tubing for corrosion. Tubing will be inspected where it emerges in the cabinet. Life expectancy data needed.		1) Instrument tubing within 271 is in good condition showing quality workmanship in routing and terminations. No corrosion or leaks were noted. Estimated life expectancy is 10 years.
AW/12.1.1.4	Pressure Switch/Alarm	1. Estimate age of equipment 2. Recent Maint. Freq. of repair. 3. Estimate calibration capability. 4. Known problems. 5. Take a few Photographs of the pressure sw rack.		1) Estimated age of equipment is 15 years 2) Low repair rate 3) Calibration on annual rotation, performed in the field at 1 hour per instrument. 4) No recurrent problems

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT QUESTIONNAIRE INSTRUMENTS & CONTROL SYSTEMS			
REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS	
		DESCRIPTION	
AW/12.1.1.5	Pressure Recorder (241-AW-271)	1. Estimate age of equipment 2. Recent Maint. Freq. of repair. 3. Estimate calibration capability. 4. Known problems. 5. Take a Photograph of recorder.	1) Estimated age of equipment is 15 years 2) Continual repair action required 3) Calibration is on an annual rotation, performed in the field at 1 hour per instrument. 4) Continual repair action is required and equipment often requires extensive repairs to bring it within calibration tolerances.
AW/12.1.2	HEPA Filter Diff. Pressure Instr.	1. Estimate age of equipment 2. Recent Maint. Freq. of repair. 3. Estimate calibration capability. 4. Known problems. 5. Take a few Photographs of the gauges.	1) estimated age of equipment is 15 years 2) Low repair rate 3) Calibration is on a annual rotation, performed in the field at 30 minutes per instrument. 4) No recurrent problems
AW/12.1.3	Temperature Instrumentation	1. Assess with heaters.	See below.
AW/12.1.4	Heater Control Subsystem	1. Estimate age of equipment 2. Recent Maint. Freq. of repair. 3. Estimate calibration capability. 4. Known problems. 5. Take a Photograph of a typical heater controller.	1) Estimated age of equipment is 15 years 2) Frequent failures 3) No calibration is performed. Functional test is performed by electricians at unknown intervals. 4) Temperature probe failures are frequent and common.
AW/12.1.5	Fan-Motor Control Subsystem	1. Take guidance from HVAC assessment.	1) Control and supply circuits are in poor repair. Automatic change over circuits do not operate correctly due to lack of maintenance
AW/12.1.6	Damper Control Subsystem	1. Take guidance from HVAC assessment.	1) Barber Coleman damper actuators and linkages are in disrepair on the K2-E-2 annulus system.
AW/12.1.8	Regulated Stack Monitoring System (296-A-27)	Inst. Sensitivity (DCG)	
AW/12.1.8.1.1	Sample Probe and Tubing	1. Inspect the tubing where it is visible.	1) Tubing is in good condition and absent of corrosion. Inadequate support and routing was noted.
AW/12.1.8.1.2	Radiation Analyzer	1. Estimate age of equipment 2. Recent Maint. Freq. of repair. 3. Estimate calibration capability. 4. Known problems. 5. Take several Photograph inside the cabinet.	1) Estimated age of equipment is 15 years 2) Low repair rate 3) Calibration is on an annual rotation, performed in the shop at 4 hours per instrument. 4) The CAMS weigh in excess of 100 pounds and are hard to access for removal from the cabinets for maintenance or calibration.
AW/12.1.8.1.3	Equipment Cabinet	1. Inspect cabinet for corrosion.	1) Cabinet doors no longer seal properly allowing dirt and moisture inside cabinet. Light corrosion was noted.

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT QUESTIONNAIRE INSTRUMENTS & CONTROL SYSTEMS				
REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS		FINDINGS - COMMENTS
		DESCRIPTION		
AW.12.1.8.1.4	Vacuum Pumps	1. Estimate age of equipment 2. Recent Maint. Freq. of repair. 3. Estimate calibration capability. 4. Known problems.	1) Estimated age of equipment is 15 years 2) No maintenance history was available (maintenance is performed by the millwrights) 3) No calibration performed. Functional test only. 4) No known recurrent problems	
AW.12.1.8.1.5	Recorder	1. Estimate age of equipment 2. Recent Maint. Freq. of repair. 3. Estimate calibration capability. 4. Known problems.	Not Assessed. (But see AW.11.2.1.4 for typical problem areas.)	
AW.13	TRANSFER LINE CONTROL SYSTEM			
AW.13.1	PUMP CONTROL SUBSYSTEM	1. Inspect 240VAC,480VAC wiring & controls for Code compliance.	3.2 thru 3.5 are associated with evaporator and were not included in this inspection.	
AW.13.2	VALVE POSITION INSTRUMENTATION/ INDICATION			
AW.13.3	VALVE CONTROL SYSTEM			
AW.13.4	PRESSURE SWITCH INSTRUMENTATION (Flow Indication)			
AW.13.5	WASTE FLOW MONITORING INSTRUMENTATION	1. Waste Flow Inst. does not exist.		
AW.14	TANK CONTENTS MONITORING SYSTEM			
14.1	TEMPERATURE/VAPOR INSTRUMENTATION	For one typical thermocouple tree: 1. Estimate age of equipment 2. Recent Maint. Freq. of repair. 3. Estimate calibration capability. 4. Known problems. 5. Inspect the T/C wiring and estimate life expectancy of T/C wiring. 6. Take a Photograph of the interior of the TBX.	1) Estimated age of equipment is 15 years 2) Low repair rate 3) Calibration is performed on an annual rotation, performed in the field at 4 hours per instrument loop. 4) Failure of thermocouples during severe electrical storms.	
AW.14.2	STANDARD HYDROGEN MONITORING SYSTEM (Ammonia)			

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT QUESTIONNAIRE INSTRUMENTS & CONTROL SYSTEMS				
REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS		FINDINGS - COMMENTS
		DESCRIPTION		
AW/14.3	CHEMICAL COMPOSITION INSTRUMENTATION	AW/14.3.1 Specific Gravity Inst. is only installed in AW-102. No SpG Inst. are installed in 101, 103-106.		1) Estimated age of equipment is 15 years 2) Low repair rate 3) Calibration is performed on an annual rotation, performed in the field at 2 hours. 4) No known recurrent problems.
AW/14.4	TANK LIQUID SURFACE LEVEL INSTRUMENTATION			
AW/14.4.1	FIC Riser Extension	1. Inspect riser extension for corrosion.		1) No corrosion was noted on the riser extension.
AW/14.4.2	FIC Sensor	1. Estimate age of equipment 2. Recent Maint. Freq. of repair. 3. Estimate calibration capability. 4. Known problems. 5. Take a few Photographs of the FIC Sensors		1) Estimated age of equipment is 15 years 2) Frequent failure to the electronics and sensor occur 3) Calibration is performed on a 6 month rotation, performed in the field at 4 hours per instrument. 4) Frequent repairs are caused by failure to sense liquid level which causes the tape to continue to reel out which damages the tape.
AW/14.4.3	FIC Buried Signal Cable	1. If possible, inspect where it terminates in the TBX.		1) Access not allowed at this time
AW/14.4.4	Terminal Boxes	1. Inspect TBX for corrosion.		1) Access not allowed at this time, although the terminal boxes that were inspected revealed the following: The integrity of the weather tight boxes has been compromised by drilling wrap holes or by the use of non-weather tight fittings on the conduit penetrations.
AW/14.5	SLUDGE WEIGHT (LEVEL) MONITORING	1. Estimate age of equipment 2. Recent Maint. Freq. of repair. 3. Estimate calibration capability. 4. Known problems. 5. Take a few Photographs of the Sludge Weight Flake Box.		
AW/15	TANK CONTENTS MIXING SYSTEMS			
AW/15.1	AIR LIFT CIRCULATOR CONTROL SYSTEM			
AW/15.1.1	DIFF. PRESSURE SENSORS	1. Estimate age of equipment 2. Recent Maint. Freq. of repair. 3. Estimate calibration capability. 4. Known problems. 5. Take a Photograph of the gauges.		
AW/15.1.2	LOCAL INDICATION	1. Take Photographs of the panel.		
AW/16	SCC STATUS/MONITORING SYSTEM			

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT QUESTIONNAIRE INSTRUMENTS & CONTROL SYSTEMS				
REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS		FINDINGS - COMMENTS
		DESCRIPTION		
AW.16.1	AC POWER SUPPLY STATUS INST.			
AW.16.2	AIR SUPPLY STATUS INST.			
AW.16.3	WATER SUPPLY STATUS INST.			
AW.16.4	TANK CONCRETE STRUCTURE TEMPERATURE INST.		1. Inspect T/C wires inside of a typical TBX at a tank. Estimate life expectancy of T/C wiring. 2. Take Photographs inside TBX.	
AW.16.5	HEAT TRACE SYSTEM STATUS INST.			
AW.16.6	CATHODIC PROTECTION SYSTEM STATUS INST.			
AW.17	HEAT TRACE CONTROL SYSTEM			
AW.17.1	TEMPERATURE (T/C) MONITORING SENSORS			
AW.17.2	TEMP. CONTROLLER SUBSYSTEM		1. Estimate age of equipment 2. Recent Maint. Freq. of repair. 3. Estimate calibration capability. 4. Known problems. 5. Take a Photograph of typical Temp. controller.	
AW.17.3	OVER TEMP. CONTROLLER SUBSYSTEM		1. Estimate age of equipment 2. Recent Maint. Freq. of repair. 3. Estimate calibration capability. 4. Known problems. 5. Take a Photograph of a typical overtemp. controller.	
AW.17.4	HEATER CONTACTOR		1. Inspect 240/480 VAC wiring for NEC compliance.	
AW.18	CATHODIC PROTECTION CONTROL SYSTEM		1. Inspect wiring for NEC compliance.	

5.7 CAIS data Sheets

241AW INSTRUMENT SYSTEMS NARRATIVE

INSPECTION METHODS AND REPORT FORMAT

The inspection data was collected by a combination of field inspections and interviews with instrument technicians and operations personnel that have a minimum of ten years experience with tankfarm equipment. The inspection included equipment located within 241AW tankfarm and 271AW instrument building. Instruments located at the 242A evaporator complex were not included. Only major components or deficiencies will be addressed in this report due to the multiple instrumentation sub-systems used to support 241AW.

EQUIPMENT DESCRIPTION

Instrumentation for leak monitoring is located in the tank annulus, pump pit, annulus pump pit, the clean out boxes, and the waste transfer piping. This equipment monitors for leaks originating at each respective location. The leak detection pit monitoring equipment detects gamma radiation in effluent originating from a breach in the inner and outer shells. Radiation monitoring instruments are installed on the ventilation stacks of the primary and annulus exhausts. Tank 102 instruments, which supports the 242A evaporator, also measures specific gravity of the tank contents.

Ventilation instruments monitor and alarm a loss of ventilation to the annulus and the primary tank, loss of blast heaters at the primary, and high or low tank pressure. Waste level is monitored and alarmed which also includes a manual tape reel should the FIC fail. Pump interlock circuits from various instruments are also present to shutdown pumps in the event of a leak. The 271AW instrument building contains the annunciator alarm panels, Ashcroft snap action pressure to current switches, Foxboro chart recorders, Canberra radiation monitors, relay panels, the CASS interface electronics, a continuous air monitor (CAM), and various other signal wire terminations and relay panels.

SYSTEMS CONDITION SUMMARY

241AW.I1.1 LEAK DETECTION PUMP/SUMP INSTRUMENTATION

The leak detection pit gamma probe well collects moisture from a combination of water intrusion through the cover plate and through condensation build up. This creates shorts in the signal feed at the gamma probe causing frequent repair action

to be taken. An appropriate water tight replacement cable would be a possible solution to this problem.

Moderate to severe corrosion was noted where the buried steel pipe is stubbed out of the ground, indicating that the piping underground is in poor repair also.

Access doors and seals to the cabinets are damaged or worn, allowing moisture and dirt infiltration.

241AW.I1.2 ANNULUS LEAK INSTRUMENTATION

The CAMs used in the radiation monitoring system are difficult to access for maintenance or repair action (they weigh in excess of 100 pounds).

The annulus leak detectors have condensate buildup within the instrument enclosure. The condensation is due to the moisture in the large volume of purge air used, (a good candidate for replacement to reduce instrument air use). The wire termination box is fabricated from plexiglass which causes the wire insulation to deteriorate from the exposure to the direct sunlight.

The chart recorders used in the 271AW instrument building have a history of chronic repair action. Repair action is often required in order to bring the instrument into calibration tolerances. This is due to age of the equipment (15 years plus) and the outdated technology.

241AW.I2.1 TANK PRIMARY VENTILATION SYSTEM

The chart recorders used in the 271AW instrument building have a history of chronic repair action. Repair action is often required in order to bring the instrument into calibration tolerances. This is due to age of the equipment (15 years plus) and the outdated technology.

Thermostats for the blast heaters fail frequently rendering the heaters inoperable. The control circuits are in poor repair. During the inspection of the primary fans at the MCC panels a control wire fell off of the starter switch (caused by inadequate support of the wire harness). While the fan did switch over to the backup system, operations informed the inspector that once the harness was repaired it could not be returned to the original operating fan during the evaporator campaign due to problems with the change over circuits.

The regulated stack monitoring CAMs are difficult to maintain due to their weight (in excess of 100 pounds). The cabinets are in poor condition, allowing dirt and moisture infiltration.

241AW.I4 TANK CONTENTS MONITORING SYSTEM

Thermocouple probe failures are common.

The FIC liquid level sensor has a history of frequent repair action. When the sensor and/or the electronics associated with the FIC fail, it causes the tape to continue to reel out, which then requires replacement of the tape due to damage.

Most of the instrument cabinets and terminal boxes located in 241AW are in poor condition. Access doors and seals to the cabinets are damaged or worn, allowing moisture and dirt infiltration. Conduit fittings are not weather tight and weep holes have been drilled in the terminal boxes to allow for condensation build up to drain. Condensate buildup could be addressed by sealing the conduit penetrations.

241AW.I6.2 AIR SUPPLY STATUS INSTRUMENTATION

Instrument air quality is not monitored. There are indications of excessive moisture content in the purge air where it could be observed at the annulus leak detectors. The copper air distribution lines were inspected in the 271AW instrument building and in the 241AW tank farm and are in good condition. Moderate to severe corrosion was noted where the buried steel pipe is stubbed out of the ground, indicating that the piping underground is in poor repair also. The cycle rate of the instrument air compressor (cycles every 30 to 50 seconds) indicates there are possible air leaks in the buried line.

The physical condition of the instrumentation at 241AW tank farm and 271AW instrument building is rated as "adequate" 5.

CONDITION ASSESSMENT INFORMATION SYSTEM

Report : RELATED SITE EQUIPMENT

Filename : RPTEQPT.lis

Run by : CAIS

Report Date : 30-NOV-95

Parameters Entered

Parent Equipment ID: %

30-NOV-95

CONDITION ASSESSMENT INFORMATION SYSTEM

CAIS Special Report - RPT-005

Asset

Site Component
Survey Component
Survey Comment

Name

Sys No.

System Name

241AW-0000 : UNDRGRND WASTE STOR TANK FARM

241AW PIPELINE LEAK INST PIPELINE LEAK INSTRUMENTATION 1.3 PIPELINE LEAK INSTRUMENTATION

241AW SIGNAL WIRE, ETC

WIRING/CONDUIT/TERM BOXES

1.3.4 Signal Wiring/ Conduit/ Terminal Boxes

WIRING AT TERMINAL BOXES IS IN DISREPAIR
. INSULATION IS BRITTLE & CRACKED. CURRE
NT-SENSITIVE RELAYS ARE NOT CALIBRATED.
FUNCTIONAL TESTS ARE PERFORMED BY ELECTR
ICIANS & RELAYS REPLACED AS THEY FAIL.

241AW LOCAL ALARM PANELS

ANNUNCIATION & ALARM PANELS

1.7 LOCAL ALARM ANNUNCIATION & ALAR

241AW271 ANN-101 TO 106

ALARM PANEL

1.7.1 Alarm Panel (241-AW-271)

WIRING WITHIN 241AW271 BUILDING IS IN GO
OD CONDITION. NO DEFICIENCIES NOTED.

241AW TK PRIM VENTILATION SYS

TK PRIMARY VENTILATION SYSTEM

2.1 TANK PRIMARY VENTILATION SYSTE

241AW PT-101-1&2 TO 106

PRESSURE SENSOR/TRANSMITTER

2.1.1.2 Pressure Sensor/Transmitter

EST EQUIP AGE = 15 YEARS. ANNUAL FIELD CALIBRATION @ 1 HOUR/INSTRUMENT. UNABLE TO ACCESS TO ASSESS PHYSICAL CONDITION ACCURATELY.

241AW FIELD I/A TUBING INST AIR TUBING TO 271 BLDG 2.1.1.3 Field Instrument Air Tubing to AW-271

TUBING WITHIN 271 BUILDING IS IN GOOD CONDITION, SHOWING QUALITY WORKMANSHIP IN ROUTING/TERMINATION. NO CORROSION OR LEAKS NOTED. EST LIFE EXPECTANCY IS 10 YEARS.

241AW TC-1 TO 4 HEATER CONTROL SUBSYSTEM 2.1.4 Heater Control Subsystem

EST EQUIP AGE = 15 YEARS. FREQUENT FAILURES. NO CALIBRATION PERFORMED; FUNCTIONAL TESTS PERFORMED BY ELECTRICIANS @ UNKNOWN INTERVALS. TEMPERATURE PROBE FAILURES ARE FREQUENT AND COMMON.

241AW271 PAS 101-1,2 TO 106 PRESSURE SWITCH/ALARM 2.1.1.4 Pressure Switch/Alarm

241AW271 PR-101-1,2 TO 106 PRESSURE RECORDERS 2.1.1.5 Pressure Recorder (241-AW-271)

30-NOV-95

CONDITION ASSESSMENT INFORMATION SYSTEM

CAIS Special Report - RPT-005

Asset	Site Component	Name	Sys No.	System Name
Survey Component				
Survey Comment				

241AW-0000 : UNDRGRND WASTE STOR TANK FARM

EST EQUIP AGE = 15 YEARS. ANNUAL FIELD CALIBRATION @ 1 HOUR/INSTRUMENT. CONTINUAL REPAIR ACTION REQUIRED & OFTEN REQUIRE EXTENSIVE REPAIRS TO BRING BACK WITHIN CALIBRATION TOLERANCES.

241AW TK DP SYS	TK DIFF PRES INST SYS	2.1.1	Tank Diff. Pressure Instr. Subs
241AW HEPA DPI	HEPA FILTER DP INSTRUMENTS	2.1.2	HEPA Filter Diff. Pressure Instr.
EST EQUIP AGE = 15 YEARS. LOW REPAIR RATE. ANNUAL FIELD CALIBRATION @ 30 MINUTES /INSTRUMENT. NO RECURRENT PROBLEMS.			
241AW M-2 & M-6	DAMPER CONTROL SUBSYSTEM	2.1.6	Damper Control Subsystem
BARBER-COLEMAN DAMPER ACTUATORS AND LINK AGES ARE IN DISREPAIR ON THE K2-5-2 ANNULUS SYSTEM, BUT CAN BE SET MANUALLY.			
241AW MCC FAN	MCC FOR PRIMARY VENT SYSTEM	2.1.5	Fan-Motor Control Subsystem

241AW FAN MOTOR CONTROL FAN MOTOR CONTROL SUBSYSTEM 2.1.5 Fan-Motor Control Subsystem

CONTROL AND SUPPLY CIRCUITS ARE IN POOR
REPAIR. AUTOMATIC CHANGEOVER CIRCUITS DO
NOT OPERATE CORRECTLY DUE TO LACK OF MA
INTENANCE.

241AW TANK CONTENTS MONITORING TK CONTENTS MONITORING SYSTEM 4. TANK CONTENTS MONITORING
SYSTE

241AW TE-101 TO 106-36 TO 53 TEMP/VAPOR INSTRUMENTATION 4.1 TEMP/VAPOR INSTR.

EST EQUIP AGE = 15 YEARS. LOW REPAIR RAT
E. ANNUAL FIELD CALIBRATION @ 4 HOURS/IN
STRUMENT LOOP. FAILURE OF THERMOCOUPLES
DURING SEVERE ELECTRICAL STORMS.

241AW SPG-102-1
INSTRUMENTATION CHEM COMPOSITION INSTRUMENTATI 4.3 CHEMICAL COMPOSITION

EST EQUIP AGE = 15 YEARS. LOW REPAIR RAT
E. ANNUAL FIELD CALIBRATION @ 2 HOURS.
NO KNOWN RECURRENT PROBLEMS.

241AW LLI-101 TO 106 FIC RISER EXTENSION 4.3.1 FIC Riser Extension

30-NOV-95

CONDITION ASSESSMENT INFORMATION SYSTEM

Page 3 of 6

CAIS Special Report - RPT-005

Asset	Site Component	Name	Sys No.	System Name
Survey Component				
Survey Comment				

241AW-0000 : UNDRGRND WASTE STOR TANK FARM

NO CORROSION WAS NOTED ON THE RISER EXTENSION.

241AW LE-101 TO 106-1 FIC SENSOR 4.3.2 FIC Sensor

EST EQUIP AGE = 15 YEARS. FREQUENT FAILURE TO ELECTRONICS & SENSOR OCCUR. 6 MONTH FIELD CALIBRATION @ 4 HOURS/INSTRUMENT . FREQUENT REPAIRS ARE CAUSED BY FAILURE TO SENSE LIQUID LEVEL WHICH CAUSES TAPE TO CONTINUE UNREELING WHICH DAMAGES THE TAPE.

241AW271-0000 : TANK FARM CONTROL HOUSE

241AW RM GAMMA RAD MONITORING SUBSYSTEM 1.1.1 Gamma Radiation Monitoring Sub

241AW-01 TO 06C GAMMA PROBE WELL STRUCTURE 1.1.1.1 Gamma Probe Well Structure

METAL COVER PLATE IS NOT SEALED & DOES LEAK WATER, HOWEVER THE MAJORITY OF WATER ACCUMULATION IS CAUSED BY CONDENSATION.

241AW-RE-01 TO 06C-1 GAMMA PROBE & WELL CABLE 1.1.1.2 Gamma Probe & Well Cable

CABLE IS RG59 COAXIAL. ALTHOUGH THE CABLE IS SEALED WITH RTV, I&C TECHS INDICATE THAT CABLE FAILURE AT THE CONNECTIONS IS A CONSTANT PROBLEM.

241AW271 CRM-01 TO 06C-1 COUNT RATE METERS/ALARM COMP 1.1.1.5 Count Rate Meters/ Alarm comparators.

EST EQUIP AGE = 15 YEARS. LOW REPAIR RATE; CALIBRATION ON 6 MO ROTATION, PERFORMED IN SHOP @ 4 HRS PER INSTRUMENT. NO RECURRENT PROBLEMS.

241AW WFM	WEIGHT FACTOR MONITORING	1.1.2	Weight Factor Monitoring Subsystem
241AW C AP	COMPRESSED AIR SUPPLY	1.1.2	Weight Factor Monitoring Subsystem
THE QUALITY OF THE INSTRUMENT AIR IN AW IS NOT MONITORED, HOWEVER THE I&C TECH SUSPECTS THAT MOISTURE CONTENT IS HIGH.			
241AW SAMPLE TUBES	SAMPLE TUBES @ LEAK DET PIT	1.1.2.1	Sample Tubes (Leak Det. Pit)

ACCESS NOT ALLOWED AT THE TIME OF INITIAL INSPECTION.

30-NOV-95

CONDITION ASSESSMENT INFORMATION SYSTEM

CAIS Special Report - RPT-005

Asset

Site Component	Name	Sys No.	System Name
Survey Component			
Survey Comment			

241AW271-0000 : TANK FARM CONTROL HOUSE

241AW WFA/WFI/SGI

WEIGHT FACTOR PRESSURE SENSORS 1.1.2.2 Weight Factor Pressure Sensors

EST AGE OF EQUIP = 15 YEARS. LOW REPAIR RATE; ANNUAL CALIBRATION PERFORMED IN THE FIELD @ 1 HOUR PER INSTRUMENT. NO CURRENT PROBLEMS.

241AW WSTA-PNL-201 TO 206

WF CABINET XMITTER ENCLOSURE 1.1.2.3 Weight Factor Cabinet (Xmitter Enclosure

241AW WF/SPG-TUBING

FIELD TUBING 1.1.2.4 Field Tubing

COPPER TUBING TO INSTRUMENT PANELS IN 241AW HAS NO INDICATION OF DAMAGE OR CORROSION. EST LIFE IS 10 YEARS. STEEP PIPING (WHERE STUBBED OUT & TRANSITIONS TO CU) INDICATES MODERATE TO SEVERE CORROSION. EST LIFE OF BURIED CS PIPING IS 5 YEARS

241AW271 WFAS-01 TO 06C

WF PRESSURE SWITCHES/ALARMS 1.1.2.5 W.F. Pressure Switches/ Alarms Cabinet

EST EQUIP AGE = 15 YEARS. LOW REPAIR RATE

E. ANNUAL FIELD CALIBRATION @ 1 HOUR PER INSTRUMENT. NO RECURRENT PROBLEMS.

241AW CAM RM	ANNULUS CAM RAD MONITORING SYS	1.2.1	CAM Radiation Monitoring Subsy
241AW EXH-101 TO 106	AIR SAMPLER PROBE/TUBING/ETC	1.2.1.1	Air Sampler Probe/ Tubing/ etc
PROBE COULD NOT BE ACCESSED AT THE TIME OF THE INITIAL INSPECTION. TUBING HAS NO SIGNS OF CORROSION OR DAMAGE.			
241AW RAN-EXH-101 TO 106-1	RADIATION ANALYZER	1.2.1.2	Radiation Analyzer
EST EQUIP AGE = 15 YEARS. LOW REPAIR RATE. ANNUAL SHOP CALIBRATION @ 4 HOURS PER INSTRUMENT. CAMS WEIGHT > 100# & ARE HARD TO ACCESS FOR REMOVAL FROM CABINETS FOR MAINTENANCE OR CALIBRATION.			
241AW WIRING/CONDUIT	SIGNAL WIRING & CONDUIT	1.2.1.5	Signal Wiring/ Conduit

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CONDITION ASSESSMENT INFORMATION SYSTEM

CAIS Special Report - RPT-005

Asset	Site Component	Name	Sys No.	System Name
Survey Comment				

241AW271-0000 : TANK FARM CONTROL HOUSE

SIGNAL WIRING COULD NOT BE ACCESSED AT THE TIME OF THE INITIAL INSPECTION. THE CONDUIT THAT COULD BE VIEWED IS IN GOOD CONDITION, ALTHOUGH MOST OF THE JUNCTION BOXES LOCATED ON THE EXHAUST FANS ARE MODERATELY CORRODED & SHOULD BE REPLACED WITHIN THE NEXT 4 YEARS.

241AW LDE 101 2-4, 102-106 LDE SENSORS-FLAKE BOX & TAPE 1.2.2 Liquid Presence Sensor (Flake Box & Manu

EST EQUIP AGE = 15 YEARS. LOW REPAIR RATE. NO CALIBRATION PERFORMED; FUNCTION TEST PERFORMED MONTHLY. TERMINAL BOXES EXHIBITED PRESENCE OF CONDENSATION AT ALL FLAKE BOXES. O-RING SEALS FREQUENTLY REPLACED. LARGE VOLUME OF PURGE AIR USED BY EACH UNIT.

241AW271 RREXH 101/2/3 104/5/6 3 PEN RECORDERS & ALARMS 2.1.4 Heater Control Subsystem

EST EQUIP AGE = 15 YEARS. ANNUAL FIELD CALIBRATION @ 1 HOUR PER INSTRUMENT. CONTINUAL REPAIR ACTION IS REQUIRED AND EQUIPMENT OFTEN REQUIRES EXTENSIVE REPAIRS TO

O BRING IT WITHIN CALIBRATION TOLERANCES

241AW PUMP PERMISSIVE INST	PUMP PERMISSIVE INSTRUMENTATION	1.6	PUMP PERMISSIVE INSTRUMENTATION
241AW271 RELAY PANEL	MASTER PUMP SHUTDOWN RELAY PNL	1.6.1	241-AW-271 Master Pump Shutdown Relay Pa

WIRING INSIDE RELAY PANEL IS IN GOOD CONDITION. EST EQUIP AGE = 15 YEARS. MAINT HISTORY NOT OBTAINED, BUT NO KNOWN RECURRENT PROBLEMS IDENTIFIED.

241AW271MCC A3,4 B1,4 C1,3,4	MPS PUSHBUTTON CONTROL PANEL	1.6.2	MPS Pushbutton Control Panel
NO COMMENTS NOTED.			

241AW 296-A-27 STACK MONITOR	REGULATED STACK MONITORING SYS	2.1.8	Regulated Stack Monitoring Sys
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241AW RAN-EXH-K1&K2 PROBE	SAMPLE PROBE & TUBING	2.8.1.1	Sample Probe and Tubing
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CONDITION ASSESSMENT INFORMATION SYSTEM

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CAIS Special Report - RPT-005

Asset	Site Component	Name	Sys No.	System Name

241AW271-0000	: TANK FARM CONTROL HOUSE			
TUBING IS IN GOOD CONDITION & ABSENT OF CORROSION. INADEQUATE SUPPORT & ROUTING WAS NOTED.				
241AW	RADIATION ANALYZER	RADIATION ANALYZER	2.8.1.2	Radiation Analyzer
241AW	RAN-EXH-K1 CAB, K-2 CAB	EQUIPMENT CABINETS	2.8.1.3	Equipment Cabinet
CABINET DOORS NO LONGER SEAL PROPERLY ALLOWING DIRT & MOISTURE INSIDE CABINET. LIGHT CORROSION WAS NOTED.				
241AW	VP-EXH-K1-1&2, K2-1&2	K1 & K2 VACUUM PUMPS	2.8.1.4	Vacuum Pumps
EST EQUIP AGE = 15 YEARS. NO MAINTENANCE HISTORY WAS AVAILABLE. NO CALIBRATION PERFORMED; FUNCTIONAL TEST ONLY. NO KNOWN RECURRENT PROBLEMS.				
241AW271	RR-EXH-K1 & K2	RECORDERS	2.8.1.5	Recorder

NOT ASSESSED. SEE W12.1.4 FOR TYPICAL PROBLEM AREAS.

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5.8 Other Reports

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5.9 CAMP Work Sheets

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WHC-SD-W314-ES-018, Rev 0

CAMP RATING FORM

Project Title: AW T.F.: Leak Control System: Leak Det. Pit: Gamma Rad. Mon. Subsystem

B&R Code: _____ Rev #: 0 FY: 1996

Project Id #: AW.I1.1.1 FUDS: _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.		30		30
Technological Base (R&D)		30		30
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics				
Criticality				
Infrastructure				40
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				30
Mission Capability, Capacity, & Quality				40
Asset Condition				55
National Business Strategies/Partnerships				
Highest of Each Subcategory	20	30	20	55

PROJECT RATING:	56
Final Project Rating	56

Note: 20 is a Default Rating

C.D. Acree	376-1901	9/18/95
Rated By	Ext	Date Rated

Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

ER/WM, Compliance, 30: Minimum detection capability lacking

M&I, Asset Condition, 55: Aging System, Spare Parts availability concern.

M&I, Infrastructure, 40: Substandard Operation

M&I, Mission Capability, 40: System not designed to operate in a wet environment.

Additional Information & Affected Projects

Shaded Areas Are Not For Use

WHC-SD-W314-ES-018, Rev 0 **CAMP RATING FORM**

Project Title: AW Tank Farm/Leak Control System/Leak Detection System Pit WF&SpG Monitor

B&R Code: _____ **Rev #:** 0 **FY:** 1996

Project Id #: AW.II.1.2 **FUDS:** _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.				
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics				
Criticality				
Infrastructure				40
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				50
Asset Condition				50
National Business Strategies/Partnerships				
Highest of Each Subcategory	20	20	20	50

PROJECT RATING:	50
Final Project Rating	50

Note: 20 is a Default Rating

<u>C. D. Acree</u>		<u>9/18/95</u>
Rated By	Ext	Date Rated

Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

M&I, Asset Cond., 50: Foxboro equipment is obsolete , spare parts may not be available.
M&I, Capability, 50: Does not measure liquid level directly, uses pressure.
M&I, Infrastructure, 40: System is continuous user of instrument air.

Additional Information & Affected Projects

Shaded Areas Are Not For Use

WHC-SD-W314-ES-018, Rev 0

CAMP RATING FORM

Project Title: AW Tank Farm Annulus Leak Instrumentation/ CAM Rad. monitoring System

B&R Code: _____ **Rev #:** 0 **FY:** 1996

Project Id #: AW.I1.2.1 **FUDS:** _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.				
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety	35			
Fire Protection				
Health Physics	40			
Criticality				
Infrastructure				40
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				40
Asset Condition				35
National Business Strategies/Partnerships				
Highest of Each Subcategory	40	20	20	40

PROJECT RATING:	43
Final Project Rating	43

Note: 20 is a Default Rating

C. D. Acree	9/18/95
Rated By	Date Rated

Ext	Ext
Reviewed By	Date Reviewed

Applicable Regulations or Policies

H&S, Health Physics, 40: Potential for personnel radiation exposure.
H&S, Industrial Safety, 35: Potential for personnel injury lifting CAM unit (100lbs)

Additional Information & Affected Projects

M&I, Asset Condition, 35: Aging System, subject to false alarms
M&I, Mission Capability, 40: Aging system, not latest recommend site standard, false alarms, radon interf
M&I, Infrastructure, 40: Aging System, subject to false alarms & is difficult to lift.

WHC-SD-W314-ES-018, Rev 0

CAMP RATING FORM

Project Title: AW Tank Farm annulus Leak Inst./Manual Tape Cond. Probe (FlakeBox)

B&R Code: _____ **Rev #:** 0 **FY:** 1996

Project Id #: AW.II.2.2 **FUDS:** _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.		40		
Technological Base (R&D)				30
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics				
Criticality				
Infrastructure				40
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				45
Asset Condition				50
National Business Strategies/Partnerships				
Highest of Each Subcategory	20	40	20	50

PROJECT RATING:	52
Final Project Rating	52

Note: 20 is a Default Rating

C. D. Acree		9/18/95
Rated By	Ext	Date Rated
Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

M&I, Asset Condition, 50: Deteriorated, UV damaged, elec insulation failure
M&I, Mission Capability, 45: Not a good leak detect. inst., manual operation
ER/WM, Compliance, 40: Fails to detect some leaks, subject to operator interpretation.

Additional Information & Affected Projects

M&I, Infrastructure, 40: Aging System, large consumer of instrument air.
M&I, Tech. Base, 30: Not a standard industrial design, expensive to fabricate.

WHC-SD-W314-ES-018, Rev 0

CAMP RATING FORM

Project Title: AW Tank Farm/Pipeline Leak Inst./PitLiquid Leak Detect. Sub. Sys./COB, Transfer

B&R Code: _____ **Rev #:** 0 **FY:** 1996

Project Id #: AW.I1.3.1, AW.I1.3.3, AW.I1.1.3, AW.I1.2.3 **FUDS:** _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.		50		
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety	35			
Fire Protection				
Health Physics	50			
Criticality				
Infrastructure				50
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				50
Asset Condition				55
National Business Strategies/Partnerships				
Highest of Each Subcategory	50	50	20	55

PROJECT RATING: 60
Final Project Rating 60
 Note: 20 is a Default Rating

Rated By C. D. Acree **Ext** 9/18/95
Date Rated

Reviewed By _____ **Ext** _____
Date Reviewed

Applicable Regulations or Policies

H&S, Health Physics, 50: Potential for maintenance personnel radiation exposure.
 H&S, Industrial Safety, 35: Potential for personnel injury working in pits.
 ER/WM, Compliance, 50: Cannot detect small leaks or detect secondary containment failure.

Additional Information & Affected Projects

M&I, Asset Condition, 55: Aging System, subject to false alarms
 M&I, Mission Capability, 50: System cannot detect small leaks, cannot detect secondary containment failure, cannot calibrate system, cannot verify system operability .
 M&I, Infrastructure, 50: Not compliant with NEC, wiring insulation unsafe, wiring life expectancy is short.

Shaded Areas Are Not For Use

WHC-SD-W314-ES-018, Rev 0

CAMP RATING FORM

Project Title: AW Tank Farm/Pipeline Leak Inst./Pipeline Annulus Pressure Sensor

B&R Code: _____ Rev #: 0 FY: 1996

Project Id #: AW.I1.3.2 FUDS: _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.		50		
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety	35			
Fire Protection				
Health Physics	50			
Criticality				
Infrastructure				40
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				50
Asset Condition				
National Business Strategies/Partnerships				
Highest of Each Subcategory	50	50	20	50

PROJECT RATING:	56
Final Project Rating	56

Note: 20 is a Default Rating

C. D. Acree		9/29/95
Rated By	Ext	Date Rated

Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

ER/WM, Compliance, 50: Pipelines do not have Inst. that can detect pl secondary containment failure.
M&I, Mission Capability, 50: System sensitivity is unknown, it cannot be calibrated, is difficult to verify operability, not available on all pipelines.

Additional Information & Affected Projects

H&S, Health Physics, 50: Potential for maintenance personnel radiation exposure.

M&I, Infrastructure, 40: System is continual user of instrument air.

(See AW.I1.3.1)

Shaded Areas Are Not For Use

WHC-SD-W314-ES-018, Rev 0

CAMP RATING FORM

Project Title: AW Tank Farm Pump Permissive (Master Pump Shutdown)

B&R Code: _____ Rev #: 0 FY: 1996

Project Id #: AW.I1.4 FUDS: _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.				
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics				
Criticality				
Infrastructure				45
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				55
Asset Condition				55
National Business Strategies/Partnerships				
Highest of Each Subcategory	20	20	20	55

PROJECT RATING:	55
Final Project Rating	55

Note: 20 is a Default Rating

C. D. Acree		9/18/95
Rated By	Ext	Date Rated
Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

M&I, Mission Capability, 55: Mission adversely impacted by false alarms, any alarm in all tank farms can shut down a transfer, even in farms that are unrelated.

M&I, Asset Condition, 55: Same as the Leak Detection System (re: AW.I1.3.1).

M&I, Infrastructure, 45: Spurious shutdowns cause delays and idle lots of people.

Additional Information & Affected Projects

M&I, Mission Capability, 55: System provides no operational versatility. Cannot easily make simultaneous transfers. Cannot easily isolate operations in different facilities.

Shaded Areas Are Not For Use

WHC-SD-W314-ES-018, Rev 0, CAMP RATING FORM

Project Title: AW Tank Farm Remote Alarm Signaling System (Gamewell Loop Sys.)

B&R Code: _____ **Rev #:** 0 **FY:** 1996

Project Id #: AW.I1.6 **FUDS:** _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.				
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics				
Criticality				
Infrastructure				40
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				35
Asset Condition				50
National Business Strategies/Partnerships				
Highest of Each Subcategory	20	20	20	50

PROJECT RATING:	50
Final Project Rating	50

Note: 20 is a Default Rating

C. D. Acree		9/18/95
Rated By	Ext	Date Rated

Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

M&I, Infrastructure, 40: Poor interface design, not standard hardware, spare parts problem.
M&I, Mission Capability, 35: System does not provide unique alarm identification.

M&I, Asset Condition, 50: System in poor condition, maintenance intensive, mostly doesn't work.

Additional Information & Affected Projects

Shaded Areas Are Not For Use

WHC-SD-W314-ES-018, Rev 0 **CAMP RATING FORM**

Project Title: AW Tank Farm Tank Waste High Level Alarm Subsystem

B&R Code: _____ Rev #: 0 FY: 1996

Project Id #: AW.I1.7 FUDS: _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.				
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics	45			
Criticality				
Infrastructure				40
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				55
Asset Condition				55
National Business Strategies/Partnerships				
Highest of Each Subcategory	45	20	20	55

PROJECT RATING:	57
Final Project Rating	57

Note: 20 is a Default Rating

C. D. Acree		9/29/95
Rated By	Ext	Date Rated

Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

M&I, Asset Condition, 55: Aging system, equipment is similar to Leak Detection System.
M&I, Mission Capability, 55: Cannot calibrate probe, cannot verify probe is functional.
System is not intrinsically safe, not suitable for hazardous gas environment.

Additional Information & Affected Projects

H&S, Health Physics, 45: Probe maintenance will expose workers to radiation.
M&I, Infrastructure, 40: Maintenance of probe is difficult.

WHC-SD-W314-ES-018, Rev 0
CAMP RATING FORM

Project Title: AW DST DIFFERENTIAL PRESSURE INSTR. SUBSYSTEM

B&R Code: _____ Rev #: 0 FY: 1996

Project Id #: AW.I2.1.1 FUDS: _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.				
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics				
Criticality				
Infrastructure				40
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				50
Asset Condition				40
National Business Strategies/Partnerships				
Highest of Each Subcategory	20	20	20	50

PROJECT RATING:	50
Final Project Rating	50

Note: 20 is a Default Rating

C. D. Acree		9/22/95
Rated By	Ext	Date Rated

Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

M&I, Asset Condition, 40: Equipment is obsolete (50 yr old design), spare parts availability concern.
M&I, Capability, 50: Recorders are significant maintenance effort. Pressure data is not automatically sent to electronic database.

Additional Information & Affected Projects

M&I, Asset Condition, 40: Some tubing deterioration concerns.
M&I, Infrastructure, 40: Continuous user of instrument air.

Shaded Areas Are Not For Use

WHC-SD-W314-ES-018, Rev 0

CAMP RATING FORM

Project Title: AW Tank Farm/Primary Ventilation/Regulated Stack Monitoring System

B&R Code: _____ **Rev #:** 0 **FY:** 1996

Project Id #: AW.I2.1.8 **FUDS:** _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.		55		
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics	45			
Criticality				
Infrastructure				40
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				55
Asset Condition				45
National Business Strategies/Partnerships				
Highest of Each Subcategory	45	55	20	55

PROJECT RATING:	60
Final Project Rating	60

Note: 20 is a Default Rating

C. D. Acree	9/29/95
Rated By	Date Rated

Reviewed By	Date Reviewed

Applicable Regulations or Policies

ER/WM, Compliance, 55: System is not compliant with regulatory requirements.
M&I, Mission Capability, 55: System can not detect at required limits, systems does not detect other required gaseous emissions. Not latest recommended site standard CAM

Additional Information & Affected Projects

M&I, Asset condition, 45: Aging system, difficult to lift/maintain.
H&S, Health Physics, 45: Potential radiation exposure to maintenance personnel.
M&I, Infrastructure, 40: Aging system, difficult to status HVAC system.

Shaded Areas Are Not For Use

WHC-SD-W314-ES-018, Rev 0

CAMP RATING FORM

Project Title: AW Tank Farm/Waste Flow Monitoring Inst./Service Pit Inst.

B&R Code: _____ Rev #: 0 FY: 1996

Project Id #: AW.I3.5.1 FUDS: _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.				
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics				
Criticality				
Infrastructure				
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				45
Asset Condition				40
National Business Strategies/Partnerships				
Highest of Each Subcategory	20	20	20	45

PROJECT RATING:	45
Final Project Rating	45

Note: 20 is a Default Rating

C. D. Acree		9/18/95
Rated By	Ext	Date Rated
Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

Additional Information & Affected Projects

M&I, Capability, 45: Flow meters cannot measure low flows.
M&I, Asset Condition, 40: Aging System

WHC-SD-W314-ES-018, Rev 0
CAMP RATING FORM

Project Title: AN DST WASTE; THERMOCOUPLE TREES

B&R Code: _____ **Rev #:** _____ **FY:** _____

Project Id #: AN.I4.1 **FUDS:** _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.				
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics	40			
Criticality				
Infrastructure				40
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				40
Asset Condition				35
National Business Strategies/Partnerships				
Highest of Each Subcategory	40	20	20	40

PROJECT RATING: 43

Final Project Rating 43

Note: 20 is a Default Rating

C. D. Acree		9/29/95
Rated By	Ext	Date Rated

Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

M&I, Capability, 40: Elements can not be calibrated. Elements spaced at 2 ft intervals limit capability.
 Iron lead is subject to corrosion. Note: Probe may not withstand mixer pump forces.
 H&S, Health Physics, 40: Probe maintenance will expose workers to radiation.

Additional Information & Affected Projects

M&I, Infrastructure, 40: Elements are not replaceable, probe is not maintainable.
 M&I, Asset Condition, 35: Equipment is old, but functional

WHC-SD-W314-ES-018, Rev 0

CAMP RATING FORM

Project Title: AW DST WASTE; 102-AW SPECIFIC GRAVITY INST. SUBSYSTEM

B&R Code: _____ **Rev #:** _____ **FY:** _____

Project Id #: AW.I4.3.1 **FUDS:** _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.				
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics	35			
Criticality				
Infrastructure				40
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				40
Asset Condition				40
National Business Strategies/Partnerships				
Highest of Each Subcategory	35	20	20	40

PROJECT RATING:	42
Final Project Rating	42

Note: 20 is a Default Rating

C. D. Acree		9/29/95
Rated By	Ext	Date Rated
Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

M&I, Asset Condition, 40: Equipment is obsolete (50 yr old design). Spare may not be available soon.
M&I, Capability, 40: System functionality is marginal. System has maintenance problems.
M&I, Infrastructure, 40: System is a continuous user of instrument air.

Additional Information & Affected Projects

H&S, Health Physics, 35: Maintenance of system may expose workers to radiation.

WHC-SD-W314-ES-018, Rev 0

CAMP RATING FORM

Project Title: AW DST WASTE; FIC LIQUID SURFACE LEVEL INST. SUBSYSTEM

B&R Code: _____ Rev #: _____ FY: _____

Project Id #: AW.14.4 FUDS: _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.				
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics	35			
Criticality				
Infrastructure				50
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				60
Asset Condition				60
National Business Strategies/Partnerships				
Highest of Each Subcategory	35	20	20	60

PROJECT RATING: 61

Final Project Rating 61

Note: 20 is a Default Rating

C. D. Acree		9/29/95
Rated By	Ext	Date Rated

Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

M&I, Asset Condition, 60: FIC gauges are inoperative. Extensive maintenance is normally required.
M&I, Capability, 60: FIC Gauges have poor resolution.
M&I, Infrastructure, 50: Poor resolution of FIC gauges exacerbates mass balance computation
for checking waste transfer operations.

Additional Information & Affected Projects

H&S, Health Physics, 35: Maintenance of the FIC may expose workers to radiation.
M&I, Infrastructure, 50: Future spare parts problem.

WHC-SD-W314-ES-018, Rev 0

CAMP RATING FORM

Project Title: AW Tank Farm/Pipeline Heat Trace I&C Subsystem

B&R Code: _____ Rev #: 0 FY: 1996

Project Id #: AW.17 FUDS: _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.				
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics				
Criticality				
Infrastructure				40
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				40
Asset Condition				50
National Business Strategies/Partnerships				
Highest of Each Subcategory	20	20	20	50

PROJECT RATING:	50
Final Project Rating	50

Note: 20 is a Default Rating

C. D. Acree		9/29/95
Rated By	Ext	Date Rated

Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

M&I, Asset Condition, 50: Some Pipelines have broken heat trace heaters.
M&I, Capability, 40:
M&I, Infrastructure, 40: Lack of pipe heating may affect transfer capability on some pipelines.

Additional Information & Affected Projects

6.0 AY TANK FARM

6.1 PDRD Cross Reference Tables

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PROJECT W-314 PDRD CROSS REFERENCE TABLE Instrument & Control Systems				
PDRD FUNCTION ID#	PDRD FUNCTION VERB	PDRD DATA VARIABLE	EQUIPMENT REFERENCE TREE	COMMENTS
3.2.1.1.1.1.1	Monitor	Hydroxide conc. Nitrate concentration Nitrite concentration Sodium concentration Specific Gravity	Non-existent architecture Non-existent architecture Non-existent architecture Non-existent architecture AY.14.3.1	Manual Sampling, Lab. Analysis function
3.2.1.1.1.1.2	Compare	Hydroxide conc. Nitrate concentration Nitrite concentration	Non-existent architecture Non-existent architecture Non-existent architecture	Lab. Analysis function
3.2.1.1.1.2.1.2	Compare	Specific Gravity	AY.14.3.1	Weight Factor Monitoring is just monitoring.
3.2.1.1.1.2.1.3	Compare	Sodium concentration	Non-existent architecture	Lab. Analysis function
3.2.1.1.1.2.1.4	Compare	Pu concentration	Non-existent architecture	Lab. Analysis function
3.2.1.1.1.3	Alarm	Waste composition	Non-existent architecture	Administrative function
3.2.1.1.1.4	Control	Waste composition	Non-existent architecture	Administrative function
3.2.1.1.1.5	Monitor	Supernate Liquid Level	AY.14.4.2	Old FIC gauges are being replaced with Enraf gauges
			AY.11.7	Old high level probes, field wiring and relays require replacement.
3.2.1.1.1.6	Compare	Supernate Liquid Level	Not Assessed	Old CASS computer function
			AY.11.4	Old relays work in Master Pump Shutdown (re: AY.11.4)
3.2.1.1.1.7	Alarm	Supernate Liquid Level	Not Assessed	Old CASS computer function
			AN.11.4	Local Alarm function (re: AY.11.5)
3.2.1.1.1.8	Control	Supernate Liquid Level	Not Assessed AN.13.1	Administrative function, manual pump control.
3.2.1.1.1.9	Monitor	Waste Temperature	AY.14.1	Old Manual Operation

PROJECT W-314

PDRD CROSS REFERENCE TABLE
Instrument & Control Systems

PDRD FUNCTION ID#	PDRD FUNCTION VERB	PDRD DATA VARIABLE	EQUIPMENT REFERENCE TREE	COMMENTS
3.2.1.1.1.10	Compare	Waste Temperature	Not Assessed	Old Manual Input to CASS
3.2.1.1.1.11	Alarm	Waste Temperature	Not Assessed	Old Output Report from CASS
3.2.1.1.1.12 3.2.1.2.1.1	Control	Waste Temperature (indirectly) Ventilation System Airflow	Not Assessed re: AY.12.1.5	Administrative function, Manual adjustment required on old system. Project W-030 will improve.
3.2.1.1.1.13	Monitor	Waste Level	AY.14.4.2	Enrafts are replacing the old FIC. See part 3.2.1.1.1.5
3.2.1.1.1.14	Compare	Waste Level	Not Assessed	See 3.2.1.1.1.6
3.2.1.1.1.15	Alarm	Waste Level	Not Assessed	See 3.2.1.1.1.7
3.2.1.1.1.16	Control	Waste Level	No automatic control architecture, re: AY.13.1	Administrative function
3.2.1.1.1.17(.1)	Monitor	Leak Det. Pit Radiation Level	AY.17.1.1	
3.2.1.1.1.17(.1)	Monitor	Leak Det. Pit Temperature	AY.11.1.4, Not Assessed	* Trade Study should reassess the need for this instrument. Suggest deletion and revised PDRD.
3.2.1.1.1.17(.1)	Monitor	Leak Det. Pit Waste Level	AY.11.1.2	
3.2.1.1.1.17(.2)	Monitor	Tank Annulus Radiation Level	AY.11.2.1	
3.2.1.1.1.17(.2)	Monitor	Tank Annulus Liquid Presence/Level	AY.11.2.2	
3.2.1.1.1.18	Compare	Leak Det. Pit Radiation Level	AY.11.1.1.5	
3.2.1.1.1.18	Compare	Leak Det. Pit Temperature	Not Assessed	* Trade Study should reassess the need for this instrument. Suggest deletion and revised PDRD.
3.2.1.1.1.18	Compare	Leak Det. Pit Water Level	AY.11.1.2.5	

PROJECT W-314 PDRD CROSS REFERENCE TABLE Instrument & Control Systems				
PDRD FUNCTION ID#	PDRD FUNCTION VERB	PDRD DATA VARIABLE	EQUIPMENT REFERENCE TREE	COMMENTS
3.2.1.1.1.18	Compare	Tank Annulus Radiation Level	AY.I1.2.1.4	
3.2.1.1.1.18	Compare	Tank Annulus Liquid Presence/Level	AY.I1.2.2	
3.2.1.1.1.19	Alarm	Leakage From Tank Bottom	AY.I1.2.1.4	
3.2.1.1.1.19	Alarm	Leakage From Tank Annulus	AY.I1.1.2.5 AY.I1.1.1.5	
3.2.1.1.1.20	Control	Leakage From Tank Bottom	Not Assessed re: AY.I3.1 & L.D.P pump	Administrative function
3.2.1.1.1.20	Control	Leakage From Tank Annulus Bottom	Not Assessed	Administrative function
3.2.1.1.1.21	Monitor	Leak Det. Pit Liquid Level	See 3.2.1.1.1.17(1)	
3.2.1.1.1.22	Compare	Leak Det. Pit Liquid Level	See 3.2.1.1.1.18	
3.2.1.1.1.23	Alarm	Leak Det. Pit Liquid Level	See 3.2.1.1.1	
3.2.1.1.1.24	Control	Leak Det. Pit Liquid Level	AY.I1.1.2.5	
3.2.1.1.1.25	Monitor	Tank Vapor Space Temperature Gradient	AY.I4.1	Old CASS Data Loggers. Old manual operation
3.2.1.1.1.26	Compare	Tank Vapor Space Temperature Gradient	Not Assessed	Old CASS operation
3.2.1.1.1.27	Alarm	Tank Vapor Space Temperature Gradient	Not Assessed	Old CASS operation

PROJECT W-314 PDRD CROSS REFERENCE TABLE Instrument & Control Systems				
PDRD FUNCTION ID#	PDRD FUNCTION VERB	PDRD DATA VARIABLE	EQUIPMENT REFERENCE TREE	COMMENTS
3.2.1.1.1.28	Control	Tank Vapor Space Temperature Gradient	Not Assessed re: AY.12.1.5	Administrative function
3.2.1.1.1.29	Monitor	Tank (Concrete) Structure Temperature	AY.16.4	Old Data Logger connects to CASS
3.2.1.1.1.30	Compare	Tank (Concrete) Structure Temperature	Not Assessed	Old CASS operation
3.2.1.1.1.31	Alarm	Tank (Concrete) Structure Temperature	Not Assessed	Old CASS operation
3.2.1.1.1.32 3.2.1.2.1.1.2	Control	Tank (Concrete) Structure Temperature (indirectly) Ventilation System Airflow	Not Assessed re: AY.12.1.5	Administrative function Project W-030 will improve.
3.2.1.1.1.33	Monitor	Tank Vapor Space Pressure	AY.12.1.1.2 AY.12.1.1.5	
3.2.1.1.1.34	Compare	Tank Vapor Space Pressure	AY.12.1.1.4	
3.2.1.1.1.35	Alarm	Tank Vapor Space Pressure	AY.12.1.1.4	
3.2.1.1.1.36	Control	Tank Vapor Space Pressure	Not Assessed re: AY.12.1.5 & AY.12.1.6	Administrative function. Project W-030 will improve. Trade Study should assess need for automation.
3.2.1.1.1.37	Monitor	Tank Flammable Gas Concentration	Not Assessed	
3.2.1.1.1.38	Compare	Tank Flammable Gas Concentration	Not Assessed	

PROJECT W-314 PDRD CROSS REFERENCE TABLE Instrument & Control Systems				
PDRD FUNCTION ID#	PDRD FUNCTION VERB	PDRD DATA VARIABLE	EQUIPMENT REFERENCE TREE	COMMENTS
3.2.1.1.1.39	Alarm	Tank Flammable Gas Concentration	Not Assessed	
3.2.1.1.1.40 3.2.1.2.4 3.2.1.2.5	Control (Maintain, Adjust)	Tank Flammable Gas Concentration Tank Ventilation System Airflow	Not Assessed re: AY.12.1.5 & AY.12.1.6	Administrative function. Project W-030 will improve. Trade Study should assess need for tie-in to new HVAC control system may be required.
3.2.1.1.1.41	Monitor	Untreated Gaseous Effluent Temperature	AY.12.1.3	Also see AY.12.1.4, Heater Control Project W-030 will improve
3.2.1.1.1.42	Monitor	Treated Gaseous Effluent Radionuclide Particulate Concentrations	AY.12.1.8	
3.2.1.1.1.42	Monitor	Treated Gaseous Effluent Temperature	AY.12.1.8	
3.2.1.1.1.42	Monitor	Treated Gaseous Effluent Moisture level	Non-existent architecture	
3.2.1.1.1.42	Monitor	Treated Gaseous Effluent Organic Vapor Concentration	Non-existent architecture	
3.2.1.1.1.42	Monitor	Treated Gaseous Effluent Hazardous/ Toxic Vapor Particulate Concentrations	Non-existent architecture	

PROJECT W-314 PDRD CROSS REFERENCE TABLE Instrument & Control Systems				
PDRD FUNCTION ID#	PDRD FUNCTION VERB	PDRD DATA VARIABLE	EQUIPMENT REFERENCE TREE	COMMENTS
3.2.1.1.1.43(.1)	Compare	Treated Gaseous Effluent Radionulide Particulate Concentrations	AY.12.1.8 See HVAC Assessment	
3.2.1.1.1.43	Compare	Treated Gaseous Effluent Temperature	AY.12.1.8	
3.2.1.1.1.43	Compare	Treated Gaseous Effluent Moisture Level	Non-existent architecture	
3.2.1.1.1.43	Compare	Treated Gaseous Effluent Organic Vapor Concentration	Non-existent architecture	
3.2.1.1.1.43(.2)	Compare	Treated Gaseous Effluent Hazardous/ Toxic Vapor - Particulate Concentrations	Non-existent architecture	
3.2.1.1.1.44	Alarm	Treated Gaseous Effluent Radionulide Particulate Concentrations	AY.12.1.8	Recorders in 242-A functionality should be upgraded.
3.2.1.1.1.44	Alarm	Treated Gaseous Effluent Temperature	Not Assessed	
3.2.1.1.1.44	Alarm	Treated Gaseous Effluent Moisture Level	Non-existent architecture	

PROJECT W-314 PDRD CROSS REFERENCE TABLE Instrument & Control Systems				
PDRD FUNCTION ID#	PDRD FUNCTION VERB	PDRD DATA VARIABLE	EQUIPMENT REFERENCE TREE	COMMENTS
3.2.1.1.1.44	Alarm	Treated Gaseous Effluent Organic Vapor Concentration	Non-existent architecture	
3.2.1.1.1.44	Alarm	Treated Gaseous Effluent Hazardous/ Toxic Vapor - Particulate Concentrations	Non-existent architecture	
3.2.1.1.1.45	Control	Treated Gaseous Effluent Radionuclide Particulate Concentrations	Not Assessed re: AY.12.1.5 & AY.12.1.6 See HVAC Assessment	Administrative function.
3.2.1.1.1.45	Control	Treated Gaseous Effluent Temperature	Not Assessed	Administrative function.
3.2.1.1.1.45 3.2.1.2.7	Control	Treated Gaseous Effluent Moisture Level (indirectly) Tank Ventilation System	Non-existent architecture	Administrative function.
3.2.1.1.1.45	Control	Treated Gaseous Effluent Organic Vapor Concentration	Non-existent architecture	Administrative function.
3.2.1.1.1.45 3.2.1.2.8	Control	Treated Gaseous Effluent Hazardous/ Toxic Vapor - Particulate Concentrations (indirectly) Tank Ventilation System	Non-existent architecture	Administrative function.

PROJECT W-314 PDRD CROSS REFERENCE TABLE Instrument & Control Systems				
PDRD FUNCTION ID#	PDRD FUNCTION VERB	PDRD DATA VARIABLE	EQUIPMENT REFERENCE TREE	COMMENTS
3.2.1.1.2.2	Monitor	Essential Transfer Tank Systems/Equipment Operability Status (eg. vent. sys., waste level monitor, etc)	Non-existent architecture	Presently, Operator rounds required.
3.2.1.1.2.3	Monitor	Essential Interconnecting Systems/Equipment Operability Status (eg. heat trace, valves, pumps, etc)	AY.16, Not Assessed	Presently, Operator rounds required.
3.2.1.1.2.4	Monitor	Transfer System Operability Status (leak detection system	AY.11.3 AY.11.4	Presently, Operator rounds required.
3.2.1.1.2.5	Monitor	Essential Equipment Operability Status	AY.16	Presently, Operator rounds required.
3.2.1.1.2.6	Monitor	Waste Parameters Temperature Viscosity Specific Gravity	AY.14 AY.14.1 AY.14.3	
3.2.1.1.2.7	Detect	Waste Transfer System Containment Leaks	AY.11.3	
3.2.1.1.2.8	Monitor	Effluents	Non-existent architecture	No effluents in the Tank Farm. Service pit monitors water flow utilized for washdown.
3.2.1.1.2.9	Monitor	Motive Force	See Electrical Assessment (re: AY.13.1)	Manual ON-OFF controls, local indicators of ON-OFF condition.
3.2.1.1.2.9	Control	Motive Force	See Electrical Assessment (re: AY.13.1)	Manual ON-OFF controls,

PROJECT W-314 PDRD CROSS REFERENCE TABLE Instrument & Control Systems					COMMENTS
PDRD FUNCTION ID#	PDRD FUNCTION VERB	PDRD DATA VARIABLE	EQUIPMENT REFERENCE TREE		
3.2.1.1.2.10	Monitor	Transfer Route Isolation Devices	I&C Non-existent architecture (re: AY.13.3) See Pipeline Assessment	Manual Indication	
3.2.1.1.2.10	Control	Transfer Route Isolation Devices	I&C Non-existent architecture (re: AY.13.3) See Pipeline Assessment	Manual Operation. PDRD needs to clarify need for automated function. Trade Study must clarify function.	
3.2.1.1.2.11	Monitor	Transfer Line Waste Flow Rate	Non-existent architecture	PDRD needs to clarify need for automated function. Trade Study must clarify function.	
3.2.1.1.2.12	Monitor & Compare (Verify)	Transfer Volume	Non-existent architecture	Administrative function.	
3.2.1.1.2.13	Alarm (Annunciate)	Waste Transfer System-Structure- Component Fault(s)	AY.11.5	Administrative function. Alarm Status assessed via Operator rounds & via CASS reports.	
3.2.1.1.14	Control (Activate)	Waste Transfer Safe Shutdown Systems	AY.11.4		
3.2.1.1.2.15	Monitor & Compare (Verify)	Waste Transfer System Safe Shutdown	Non-existent architecture	Function not implemented with I & C.	
3.2.1.1.2.16	Control (Secure)	Failed Waste Transfer System Equipment	Non-existent architecture	Function not implemented with I & C.	
3.2.1.1.3	Manage Obtain Analyze Process Store Archive	System Data/Information	Data Acquisition System Not Assessed AY.11.2.1.4 AY.12.1.1.5 AY.11.6 (re: AY.14.4.5)	Chart recorders in 241-A-271 & 242-A should be functionally replaced.	
3.2.1.2.3.1	Monitor	Tank Annulus Pressure	AY.12.2.1 See HVAC Assessment	Existing equipment is manual, data needs to be connected to TMACS.	

PROJECT W-314 PDRD CROSS REFERENCE TABLE Instrument & Control Systems				
PDRD FUNCTION ID#	PDRD FUNCTION VERB	PDRD DATA VARIABLE	EQUIPMENT REFERENCE TREE	COMMENTS
3.2.1.2.3.1	Control (Maintain)	Tank Annulus Pressure	Not Assessed re: AY.12.1.5	Manual operator function. Trade Study should assess need for automation.
3.2.1.3.4	Monitor	Waste Transfer System Containment Pressure	Non-existent architecture re: AY.13.4 See Pipeline Assessment	
3.2.1.3.4	Control	Waste Transfer System Containment Pressure	Non-existent architecture See Pipeline Assessment	
3.3.1.2.3.1	Monitor	Sludge Volume	AY.14.5 Not Assessed	The PDRD should assess the need for automation.
3.3.4.1.6	Monitor	CAMs Radiation Remote Centralized Data & Alarm Display	Not Assessed	Personel protection monitoring is not monitored by TMACS. Local indication only. PDRD needs to clarify data display needs.

6.2 Functions Assessment Tables

**EXISTING TANK FARM EQUIPMENT
FUNCTIONS ASSESSMENT TABLE**
INSTRUMENTS & CONTROL SYSTEMS

REF. NO.	SYSTEM NAME	FUNCTION OR CONSTRAINT			METHOD OF ANALYSIS I. Analysis II. Inspection III. Testing	BRIEF REASON FOR DECISION
		DESCRIPTION	SOURCE	MET		
AY.11	LEAK CONTROL SYSTEM	3.2.1.1.2.4 3.2.3.3 3.2.3.4	PDRD	NO	I. See the Engineering Analysis.	Verification of the operability of the transfer route leak sensors is not reliable because of the design of the liquid leak presence sensors and the manual process used to test the sensors. Many of these sensors cannot be calibrated.
AY.11.1	LEAK DET. PIT/SUMP INST.					
AY.11.1.1	Gamma Radiation Monitoring Subsystem	3.2.1.1.1.17	PDRD	NO	I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	Sensors must operate underwater. The instrument thimble often contains water due to condensation and possible rainwater infiltration. Minimum detectable liquid leak rates are not defined. System sensitivity specification is not available.
AY.11.1.2	Weight Factor & Specific Gravity Monitoring Subsystem	3.2.1.1.1.17	PDRD	NO	I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	This equipment is obsolete and uses pneumatics to measure and transmit pressure. Liquid presence and/or level measurement is required. Level is not measured directly, but is calculated from pressure measurements. Better instrumentation exists that does not use instrument air. Degradation of inst. air piping may lead to a degradation of inst. air quality with subsequent pneumatic inst. problems. Operations desires to eliminate the need for inst. Air. A Trade Study should be carried out to verify need for this architecture.
AY.11.1.3	Liquid Presence Sensor and Buried wiring	3.2.1.1.1.17	PDRD, WAC-173-303- #160(4)(c)(iii), 40CFR-Ch1 - #265.193(c)(3)	NO	I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	The existing device will not measure low leak rates due to its design. The wiring in the pits is not NEC code compliant. "SO" cords are not suitable for outside or buried use.
AY.11.1.4	Liquid Temperature Sensor	3.2.1.1.1.17	PDRD	YES	I. See the Engineering Analysis.	Although this device meets PDRD requirements, it could be eliminated as redundant instr. as it adds little value to leak detection.
AY.11.2	ANNULUS LEAK INSTRUMENTATION	Secondary Containment Leak Detection	40CFR- CH1. #265.193(C)(3) WAC-173-303	NO	I. See the Engineering Analysis.	Leakage from secondary tank walls may be absorbed in the soil and not be detected. Note: Secondary containment floor leaks may be detected by the Leak Detection Pit systems.

EXISTING TANK FARM EQUIPMENT FUNCTIONS ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS						
REF. NO	SYSTEM NAME	FUNCTION OR CONSTRAINT			METHOD OF ANALYSIS I. Analysis II. Inspection III. Testing	BRIEF REASON FOR DECISION
		DESCRIPTION	SOURCE	MET		
AY.II.2.1	Annulus CAM Radiation Monitoring Subsystem	1. 3.2.1.1.1.17	PDRD 40CFR- CH1.#265.193(c)(3) WAC-173-303	YES ¹	I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	This system is too sensitive to Radon gas, which yields excessive false alarms. Maintenance/calibration of the system is difficult because of lifting requirements. The recorder requires extensive maintenance. Cabinets are in need of rework. A Trade Study should be carried out to determine the efficiency of this type for instrument and the appropriateness of this application.
AY.II.2.2	Annulus Liquid Presence Multiple Sensor Conductivity Probes	3.2.1.1.1.17	PDRD WAC-173-303- #160(d)(c)(iii) 40CFR-CH1- #265.193(c)(3)	NO	I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	Device must detect low liquid leak rates. The device has no method to verify the operability of the sensors. The device cannot be calibrated. This device requires an Operator to attach a meter and manually readout liquid presence data. Monitoring Frequency requirements suggest a need for automatic monitoring & recording.
AY.II.2.3	Annulus Pump Pit Liquid Presence Sensor	3.2.1.1.2.7	PDRD	NO	I. See the Engineering Analysis.	See AY.II.3.3
AY.II.3	PIPELINE LEAK INSTRUMENTATION	3.2.1.1.2.7 Secondary Containment Leak Detection	PDRD WAC-173- 303#160(d)(c)(iii) 40CFR- CH1#265.193(c)(3)	NO	I. See the Engineering Analysis.	The detection system cannot detect a failure of pipeline secondary. The detection system cannot detect a failure of the various "Transfer Pits". A Trade Study should pull together the various environment interpretations, permits and waiver requests to confirm the need for this type of system.
AY.II.3.1	C.O.B. Liquid Presence Sensor	3.2.1.1.2.7	PDRD WAC-173-303- #160(d)(c)(iii) 40CFR-CH1- #265.193(c)(3)	NO	I. See the Engineering Analysis. IIb. See Elec. CAS data sheets.	The sensor will not detect low leak rates due to its design. Its operability cannot be easily verified and it cannot be functionally tested with existing electrical circuitry. The installation has NEC Code compliance issues. Existing wiring insulation is brittle and cracked. Current sensitive relays are not (& cannot be) calibrated.

**EXISTING TANK FARM EQUIPMENT
FUNCTIONS ASSESSMENT TABLE**
INSTRUMENTS & CONTROL SYSTEMS

REF. NO.	SYSTEM NAME	FUNCTION OR CONSTRAINT			METHOD OF ANALYSIS I. Analysis II. Inspection III. Testing	BRIEF REASON FOR DECISION
		DESCRIPTION	SOURCE	MET		
AY.11.3.2	Pipeline Pressure Switch Sensor	3.2.1.1.2.10 3.2.1.3.4	PDRD	NO	I. See the Engineering Analysis.	Adequate "status of the route isolation" is not provided for all the transfer routes. This will require an Engineering analysis to determine if more pressure switches are required.
AY.11.3.3	Transfer Pits Instruments (LDE only)	3.2.1.1.2.7	PDRD WAC-173-303- #160(4)(c)(iii), 40CFR-Ch1- #265.193(c)(3)	NO	I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	The pit sensor will not detect low leak rates due to its design. Its operability cannot be easily verified and it cannot be functionally tested with existing electrical circuitry. Current sensitive relays are not (& cannot be) calibrated. Rain and melting snow infiltration are often causes of false alarms. The wiring is bad and in general does not comply with NEC requirements. "SO" cord is not rated for outside or buried applications. The terminal boxes that house the field alarm lamps have had their NEMA rating ruined by incorrect modifications. Wiring inside boxes has badly deteriorated insulation. The sensor in the central pump pit of tanks with flammable atmospheres is a concern as a potential ignition source.
AY.11.4	PUMP PERMISSIVE INSTRUMENTATION (Master Pump shutdown)	3.2.1.1.2.9 3.2.1.1.2.10 3.2.1.3.10	PDRD	NO	I. See the Engineering Analysis.	The existing system does not allow interlock versatility. (Its all or nothing.) You can not set up a transfer route and have only the appropriate leak sensors for that route active.
AY.11.4.4	[242-A Relay Panel]	3.2.1.1.2.9 3.2.1.1.2.10 3.2.1.3.10	PDRD	NO	I. See the Engineering Analysis.	See other tank farm tables.

EXISTING TANK FARM EQUIPMENT FUNCTIONS ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS						
REF. NO	SYSTEM NAME	FUNCTION OR CONSTRAINT			METHOD OF ANALYSIS I. Analysis II. Inspection III. Testing	BRIEF REASON FOR DECISION
		DESCRIPTION	SOURCE	MET		
AY.11.5	LOCAL ALARM ANNUNCIATION PANEL	3.2.1.1.2.2 3.2.1.1.2.3 3.2.1.1.2.4 3.2.1.1.2.5 3.2.1.1.2.13 3.2.1.1.3	PDRD	NO	I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	System indicators, in general, do not appear to comply with NUREG-0700 design guidelines which deal with alarm identification. Replacement of the leak detection and M.P.S. systems may render part of the old PANALARM non-functional. re: AY.11.3.4 The terminal boxes that house the field alarm lamps are not water tight (NEMA violation). re: AY.11.5.3 This system relies on old Hanford custom designed communication equipment to interface to the CASS system. The interface is obsolete and part procurement is difficult.
AY.11.6	REMOTE ALARM SIGNALING (GAMEWELL LOOP)	3.2.1.1.3	PDRD	NO	I. See the Engineering Analysis. IIa. See Field Inspection Questionnaire.	This Signaling system does not allow identification of individual leak sensing elements. The system has a long history of maintenance problems and spare parts are not readily available.
AY.11.7	TANK WASTE HIGH LEVEL ALARM SUBSYSTEM	3.2.1.1.1.5	PDRD	NO	I. See the Engineering Analysis.	Verification of the operability of these high level sensors is not reliable because of the design of the liquid presence sensors. An electrical verification is not possible because of the design. These sensors cannot be calibrated. In tanks with flammable atmosphere there is a concern that this system may be an ignition source. The current sensitive relays are not (& cannot be) calibrated with the sensor.
AY.12	VENTILATION CONTROL SYSTEM					
AY.12.1	TANK PRIMARY VENTILATION SYSTEM					

EXISTING TANK FARM EQUIPMENT FUNCTIONS ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS						
REF. NO	SYSTEM NAME	FUNCTION OR CONSTRAINT		METHOD OF ANALYSIS I. Analysis II. Inspection III. Testing	BRIEF REASON FOR DECISION	
		DESCRIPTION	SOURCE			
AY.12.1.1	Tank Diff. Pressure Instr. Subsystem	3.2.1.1.1.33 3.2.1.1.1.34 3.2.1.1.1.35	PDRD	NO I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	This equipment is obsolete and uses pneumatics to measure and transmit pressure data. Better equipment exists which does not use instrument air. The instrument air system has problems which may cause unreliable performance. Future procurement of spares may be difficult because the technology is obsolete. Old chart recorders do not connect to Electronic Database directly, thus record keeping requires handling paper strips. These recorders often require extensive maintenance. Pressure measurement data should be automatically sent to electronic Database. Renovation of the cabinets should be considered for upgrade work.	
AY.12.1.2	HEPA Filter Diff. Pressure Instr.	3.2.1.2.9 3.2.3	PDRD	Not assessed.	Project W-030 upgrade.	
AY.12.1.3	Temperature Instrumentation	3.2.1.1.1.41	PDRD	Not assessed.	Project W-030 upgrade.	
AY.12.1.4	Heater Control Subsystem	3.2.1.1.1.41	PDRD	Not assessed.	Project W-030 upgrade.	
AY.12.1.5	Fan-Motor Control Subsystem	3.2.1.2.9 3.2.1.2.10 3.2.3	PDRD	Not assessed.	Project W-030 upgrade.	
AY.12.1.6	Damper Control Subsystem	3.2.1.2.10	PDRD	Not assessed.	Project W-030 upgrade.	
AY.12.1.8	Regulated Stack Monitoring System ()	3.2.1.1.1.42 Inst. Sensitivity (DCG)	PDRD WHC-SD-EN-TI-288	NO I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	System does not comply with WDOE requirements.	
AY.12.1.9	Exhaust Condenser Subsystem Instruments	3.2.3	PDRD	Not assessed	Project W-030 upgrade.	
AY.12.2	TANK ANNULUS VENTILATION SYSTEM					
AY.12.2.1	Annulus Diff. Pressure Subsystem	3.2.1.2.3.1	PDRD	Not assessed.	Project W-030 upgrade.	

EXISTING TANK FARM EQUIPMENT FUNCTIONS ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS						
REF. NO	SYSTEM NAME	FUNCTION OR CONSTRAINT			METHOD OF ANALYSIS I. Analysis II. Inspection III. Testing	BRIEF REASON FOR DECISION
		DESCRIPTION	SOURCE	MET		
AY.13	TRANSFER LINE CONTROL SYSTEM	3.2.1.1.2.5 3.2.1.1.2.8	PDRD	NO	I. See the Engineering Analysis.	(Effluents are not monitored.)
AY.13.1	PUMP CONTROL SUBSYSTEM	3.2.1.1.2.9	PDRD	NO	I. See the Engineering Analysis.	Monitoring of Motive Force Devices is minimal, eg. no current monitoring is carried out.
AY.13.2	VALVE POSITION INSTRUMENTATION/ INDICATION	3.2.1.1.2.10	PDRD	NO	I. See the Engineering Analysis.	Transfer route identification cannot be electronically verified because valve position is not remotely monitored. Limit switches are problematic, but new technology exists which could provide continuous position indication.
AY.13.3	VALVE CONTROL SYSTEM	3.2.1.1.2.10	PDRD	NO	I. See the Engineering Analysis.	Motorized valve control does not exist.
AY.13.4	PRESSURE SWITCH INSTRUMENTATION (Flow Indication)	3.2.1.1.2.9	PDRD	NO	I. See the Engineering Analysis.	Requirements for pipeline pressure sensor for monitoring mistrouting is not clearly defined in the PDRD. Transfer route identification cannot be electronically verified because all pipelines are not monitored for pressure or flow. The PDRD should clarify which pipelines require this data function.
AY.13.5	WASTE FLOW MONITORING INSTRUMENTATION (Service Pit & Flush Pit)	3.2.1.1.2.11	PDRD	NO	I. See the Engineering Analysis.	Waste Flow Inst., in general, does not exist. The PDRD should specify which pipelines require this type of instrumentation.
AY.13.5.1	Service Pit Instrument Subsystems					
AY.13.5.1.1	Flow Monitor & Totalizer	3.2.1.1.2.11	PDRD		Not assessed	
AY.13.5.1.2	Radiation (Gamma) Monitor					Not assessed.
AY.13.5.1.3	Pipeline Pressure Sensor	3.2.1.1.2.9	PDRD		Relates to AY.13.4	Not assessed. The PDRD should clarify the need for this function.
AY.14	TANK CONTENTS MONITORING SYSTEM	3.2.1.1.2.6	PDRD	NO	I. See the Engineering Analysis.	Real-time monitoring systems for these (physical) parameters (viscosity, specific gravity, etc), in general, do not exist.

EXISTING TANK FARM EQUIPMENT FUNCTIONS ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS						
REF. NO	SYSTEM NAME	FUNCTION OR CONSTRAINT			METHOD OF ANALYSIS I. Analysis II. Inspection III. Testing	BRIEF REASON FOR DECISION
		DESCRIPTION	SOURCE	MET		
AY.14.1	TEMPERATURE/VAPOR INSTRUMENTATION	3.2.1.1.1.9 3.2.1.1.1.25 3.2.1.2.1.1.1	PDRD	NO	I. See the Engineering Analysis. Old style trees do not allow replacement of failed temperature sensor element. Temperature elements are type "J" which is susceptible to corrosion. Temperature trees that do not have removable sensors are candidates for replacement. Note: All existing trees cannot withstand mixer pump forces. (Retrieval projects may install new trees.)	
AY.14.3	CHEMICAL COMPOSITION MONITORING	3.2.1.1.1.1 3.2.1.1.1.2.1.1 3.2.1.1.1.2.1.2	PDRD	NO	I. See the Engineering Analysis. An installed real-time chemical analyzer does not exist. This is a manual effort, analysis is carried out by laboratory & is infrequently done. The PDRD should clarify the sampling frequency for each data type.	
AY.14.3.1	Weight Factor & Loop Seal Instrumentation	3.2.1.1.1.2.1.2	PDRD	NO	I. See the Engineering Analysis. This equipment is obsolete. Acquisition of spare parts in the future may be difficult. Future Manufacturer support for these types of instrumentation is uncertain. This system utilizes instrument air. Instrument air quality is an issue. Density is not measured directly, but is calculated from air pressure measurements. This complicates the calibration function and the device may not read accurately. The PDRD should reassess the need for this real-time monitoring system for these tanks.	
AY.14.4	TANK LIQUID SURFACE LEVEL INSTRUMENTATION	3.2.1.1.1.5 3.2.1.1.1.13 3.2.1.1.2.1.2	PDRD	NO, YES,	I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	1 The existing FIC gauges achieve poor resolution and require extensive maintenance. Spare parts procurement is a problem. This device must satisfy need for Mass Balance & Tank Inventory. 2 When Enraf level gauges are installed to replace the old FIC, the Enraf CIU will be required to send digital data directly to TMACS Central in order to remotely report a full range (Top of level to bottom of tank).

EXISTING TANK FARM EQUIPMENT FUNCTIONS ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS						
REF. NO	SYSTEM NAME	FUNCTION OR CONSTRAINT			METHOD OF ANALYSIS I. Analysis II. Inspection III. Testing	BRIEF REASON FOR DECISION
		DESCRIPTION	SOURCE	MET		
AY.14.5	SLUDGE WEIGHT (LEVEL) MONITORING PROBE	3.2.1.1.1.1.1	PDRD	YES	I. See the Engineering Analysis.	The device resolution is unknown but is expected to be poor. It requires an Operator to enter the farm to operate and the acquired level data is subject to Operator interpretation. This device is expensive to fabricate.
AY.15	TANK CONTENTS MIXING & HEATING SYSTEMS	Not in PDRD				This function is missing from the PDRD and should be added.
AY.15.1	AIR LIFT CIRCULATOR CONTROL SYSTEM					
AY.15.1.1	Diff. Pressure Sensors				I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	These sensors are manually read. A Trade Study should determine if the data acquisition should be automated.
AY.15.1.2	Local Indication					
AY.15.1.3	Flow Cutoff Valve					
AY.15.3	STEAM HEAT CONTROL/INSTRUMENTATION					These sensors are manually read. A Trade Study should determine if the data acquisition should be automated.
AY.16	SCC STATUS/MONITORING SYSTEM AC POWER SUPPLY STATUS AIR SUPPLY STATUS WATER SUPPLY STATUS HEAT TRACE SYS. STATUS CATHODIC PROT. SYS. STATUS Other	3.2.1.1.2.1 3.2.1.1.2.3	PDRD	NO	I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	A status summary alarm panel for all these subsystems doesn't exist. Some status are available on the old PANALARM panels. Some of the data is obtained from operator rounds. Replacement of the various instrument systems may render much of the old PANALARM non-functional.
AY.16.4	TANK CONCRETE STRUCTURE TEMPERATURE INST.	3.2.1.1.1.29 3.2.1.2.1.1.2	PDRD	NO	I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	The data loggers are obsolete. Future spare parts procurement will be a problem. The PDRD should specify which thermocouples require real-time monitoring.

EXISTING TANK FARM EQUIPMENT FUNCTIONS ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS						
REF. NO	SYSTEM NAME	FUNCTION OR CONSTRAINT			METHOD OF ANALYSIS I. Analysis II. Inspection III. Testing	BRIEF REASON FOR DECISION
		DESCRIPTION	SOURCE	MET		
AY.17	HEAT TRACE CONTROL SYSTEM	3.2.1.3	PDRD	-	Not assessed	A Trade Study should determine which pipeline need this system.
AY.18	CATHODIC PROTECTION CONTROL SYSTEM	3.2.1.3.5 Testing requirement	PDRD WAC-173-303#640	NO ¹	I. See the Engineering Analysis.	¹ The existing system doesn't seem to comply with the testing capability requirements for cathodic protection systems i.a.w. WAC.

6.3 Architecture Tree Tables

Level 1

Level 2

Level 3

Level 3

Level 2

Level 3

Level 4

Level 2

Level 3

Level 4

Level 5

Level 2

Level 3

Level 4

Level 2

Level 3

Level 4

Level 5

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Level 4

Level 5

Level 2

Level 3

Level 4

Level 2

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Level 4

Level 2

Level 2

Level 3

Level 4

Level 4

Level 2

VENTILATION
CONTROL SYSTEM
AY.12

Level 3

TANK PRIMARY
VENTILATION
SYSTEM
AY.12.1

Level 4

Regulated Stack
Monitoring
System
AY.12.1.8

Level 5

Tubing from Stack
to CAM
AY.12.1.8.1

CAMs
Radiation Analysers
AY.12.1.8.2

CAM Cabinets
AY.12.1.8.3

Vacuum Pumps
AY.12.1.8.4

2-Pen
Recorder
(242-A)
AY.12.1.8.5

Level 2

VENTILATION
CONTROL SYSTEM
AY.12

Level 3

TANK ANNULUS
VENTILATION
SYSTEM
AY.12.2

Level 4

Annulus
Diff. Pressure
Inst. Subsystem
AY.12.2.1

Level 2

Level 2

TRANSFER LINE
CONTROL SYSTEM
AY.13

Level 3

WASTE FLOW
MONITORING
INSTRUMENTATION
AY.13.5

Level 4

Service Pit
Instrument
Subsystems
AY.13.5.1

Level 5

Flow Monitor
&
Totalizer
AY.13.5.1.1

Radiation
(Gamma)
Monitor
AY.13.5.1.2

Pipeline
Pressure
Sensor
AY.13.5.1.3

Level 2

Level 2

Level 3

Level 4

Level 2

Level 3

Level 4

Level 2

Level 3

Level 4

Level 2

Level 3

Level 2

Level 3

Level 4

Level 2

Level 2

Level 3

Level 4

Level 2

Level 2

6.4 Drawing Reference Tables

EXISTING TANK FARM EQUIPMENT SYSTEM DRAWING REFERENCES INSTRUMENTS & CONTROL SYSTEMS				
REF NO.	SYSTEM NAME	DRAWING REFERENCES	NO. OF ECNs OUTSTANDING	PDRD REFERENCE
AY.II	LEAK CONTROL SYSTEM	H-2-64400	0	1. 3.2.1.1.2.4
AY.II.1	LEAK DET. PIT/SUMP INST.	H-2-64400	0	
AY.II.1.1	Gamma Radiation Monitoring Subsystem	H-2-64400	0	1. 3.2.1.1.1.17
AY.II.1.1.1	Gamma Probe Well Structure	H-2-64400, H-2-64317, H-2-64318	0	
AY.II.1.1.2	Gamma Probe & Well Cable	H-2-64400, H-2-64378	1	
AY.II.1.1.3	Field Signal Cable	H-2-64400, H-2-67272	1	
AY.II.1.1.4	reserved			
AY.II.1.1.5	Count Rate Meters/ Alarm Comparators	H-2-64365	2	
AY.II.1.2	Weight Factor & Specific Gravity Monitoring Subsystem	H-2-64400, H-2-64367	0	1. 3.2.1.1.1.17
AY.II.1.2.1	Sample Tubes (Leak Det. Pit)	H-2-64400	0	
AY.II.1.2.2	Weight Factor & Specific Gravity Pressure Sensors	H-2-64400, H-2-64367	0	
AY.II.1.2.3	Weight Factor Cabinet	H-2-64400, H-2-64367	0	
AY.II.1.2.4	Field Tubing	H-2-64400, H-2-64367	0	
AY.II.1.2.5	W.F. & SpG Pressure Switches & Indicators (Inst. Panel & Press. SW Rack)	H-2-64400, H-2-64370	0	
AY.II.1.3	Liquid Presence Sensor and Buried wiring	H-2-64400	0	1. 3.2.1.1.1.17
AY.II.1.4	Liquid Temperature Sensor	H-2-64400, H-2-64378	1	1. 3.2.1.1.1.17
AY.II.2	ANNULUS LEAK INSTRUMENTATION	H-2-64400, H-2-67294	0	1. Secondary Containment Leak Detection
AY.II.2.1	Annulus CAM Radiation Monitoring Subsystem	H-2-64400, H-2-67294	0	1. 3.2.1.1.1.17
AY.II.2.1.1	Air Sampler Probe/ Tubing/ etc	H-2-64400, H-2-67294	0	
AY.II.2.1.2	Radiation Analyzer	H-2-64400, H-2-67294	0	

EXISTING TANK FARM EQUIPMENT SYSTEM DRAWING REFERENCES INSTRUMENTS & CONTROL SYSTEMS				
REF NO.	SYSTEM NAME	DRAWING REFERENCES	NO. OF ECNs OUTSTANDING	PORD REFERENCE
AY.II.2.1.3	<i>Cabinet s</i>	H-2-64400, H-2-67294	0	
AY.II.2.1.4	<i>Recorder & Alarms</i>			
AY.II.2.1.5	<i>Signal Wiring/ Conduit</i>	H-2-67272	1	
AY.II.2.2	Annulus Liquid Presence Sensor (Flake Box & Manual Tape Conductivity Probe)	H-2-64400	0	1. 3.2.1.1.1.17
AY.II.2.3	Annulus Pump Pit Liquid Presence Sensor	H-2-64400	0	
AY.II.3	PIPELINE LEAK INSTRUMENTATION	H-2-64400, H-2-74600, H-2-94029	1	1. 3.2.1.1.2.7 2. Secondary Containment Leak Detection
AY.II.3.1	C.O.B. Liquid Presence Sensor	H-2-34965, H-2-70796, H-2-64400	0	1. 3.2.1.1.2.7
AY.II.3.2	Pipeline Pressure Switch Sensor	N/A		1. 3.2.1.1.2.10 2. 3.2.1.3.4
AY.II.3.3	Transfer Pit Instruments (LDE only)	H-2-64400	0	1. 3.2.1.1.2.7
AY.II.3.3.1	<i>Pit Liquid Presence Sensor</i>	H-2-64400, H-2-34965	0	
AY.II.3.3.2	<i>reserved</i>			
AY.II.3.3.3	<i>Pit Signal Wiring/Conduit/TBX</i>	H-2-64340, H-2-34965	0	
AY.II.3.4	Field Signal Wiring/ Conduit/ Terminal Boxes	H-2-64340	0	
AY.II.3.5	Encasement Leak Detection Pit Instruments { farm only}			
AY.II.4	PUMP PERMISSIVE INSTRUMENTATION {Master Pump shutdown}	H-2-74600	1	1. 3.2.1.1.2.9 2. 3.2.1.1.2.10 3. 3.2.1.3.10
AY.II.4.1	Master Pump Shutdown Relay Panel			1. 3.2.1.1.2.9 2. 3.2.1.1.2.10 3. 3.2.1.3.10
AY.II.4.3	Signal Wiring/Conduit/TBX	H-2-67272, H-2-64340	1	
AY.II.4.4	{242-A Relay Panel}			

EXISTING TANK FARM EQUIPMENT SYSTEM DRAWING REFERENCES INSTRUMENTS & CONTROL SYSTEMS				
REF NO.	SYSTEM NAME	DRAWING REFERENCES	NO. OF ECNs OUTSTANDING	PDRD REFERENCE
AY.11.5	LOCAL ALARM ANNUNCIATION PANEL			1. 3.2.1.1.2.2 2. 3.2.1.1.2.3 3. 3.2.1.1.2.4 4. 3.2.1.1.2.5 5. 3.2.1.1.2.13 6. 3.2.1.1.3
AY.11.5.1	(241-A-271 Alarm Panel			
AY.11.5.2	241-AY-801 Alarm Panel			
AY.11.5.3	CASS Alarm Panel Interface	H-2-64400, H-2-71550	0	
AY.11.6	REMOTE ALARM SIGNALING (GAMEWELL LOOP)	H-2-71804, H-2-71805	0	3.2.1.1.3
AY.11.7	TANK WASTE HIGH LEVEL ALARM SUBSYSTEM	H-2-64400	0	
AY.11.7.1	Waste Liquid High Level Probe	H-2-64400, H-2-64368	2	
AY.11.7.2	Tank Farm Alarm Panels			
AY.11.7.3	Signal Wiring/Conduit/TBX	H-2-64340	0	
AY.12	VENTILATION CONTROL SYSTEM			
AY.12.1	TANK PRIMARY VENTILATION SYSTEM	H-2-64462 (W-030U)GRADE H-2-131075)	0	
AY.12.1.1	Tank Diff. Pressure Inst. Subsystem	H-2-64400 (W-030U)GRADE H-2-131075)	0	1. 3.2.1.1.1.33 2. 3.2.1.1.1.34 3. 3.2.1.1.1.35
AY.12.1.1.1	Tank Riser Tubing to Pressure Sensor/Transmitter	H-2-64367 (W-030U)GRADE H-2-131075)	0	
AY.12.1.1.2	Pressure Sensor/Transmitter	H-2-64367 (W-030U)GRADE H-2-131075)	0	
AY.12.1.1.3	Field Instrument Air Tubing (???)	H-2-64461 (W-030U)GRADE H-2-131075)	0	
AY.12.1.1.4	Pressure Switch/Alarm	H-2-64365 (W-030U)GRADE H-2-131075)	2	
AY.12.1.1.5	Pressure Recorder	H-2-64365, H-2-64370 (W-030U)GRADE H-2-131075)	2	
AY.12.1.2	HEPA Filter Diff. Pressure Instr.	H-2-64462 (W-030U)GRADE H-2-131075)	0	

EXISTING TANK FARM EQUIPMENT SYSTEM DRAWING REFERENCES INSTRUMENTS & CONTROL SYSTEMS				
REF NO.	SYSTEM NAME	DRAWING REFERENCES	NO. OF ECNs OUTSTANDING	PDRD REFERENCE
AY.12.1.3	Temperature Instrumentation	H-2-64462 (W-030UPGRADE H-2-131075)	0	1. 3.2.1.1.1.41
AY.12.1.4	Heater Control Subsystem	H-2-92066 (W-030UPGRADE H-2-131075)	0	
AY.12.1.5	Fan-Motor Control Subsystem			
AY.12.1.6	Damper Control Subsystem	N/A - MANUAL (W-030UPGRADE H-2-131075)		
AY.12.1.7				
AY.12.1.8	Regulated Stack Monitoring System { }	H-2-93924, H-2-93373, H-2-93374 (W-030UPGRADE H-2-131075)	6	1. 3.2.1.1.1.42
AY.12.1.8.1	Tubing from Stack to CAM	H-2-93924, H-2-93373, H-2-93374 (W-030UPGRADE H-2-131075)	6	
AY.12.1.8.2	CAMs Radiation Analyzers	H-2-93924, H-2-93373, H-2-93374 (W-030UPGRADE H-2-131075)	6	
AY.12.1.8.3	CAM Cabinets	H-2-93924, H-2-93373, H-2-93374 (W-030UPGRADE H-2-131075)	6	
AY.12.1.8.4	Vacuum Pumps	H-2-93924, H-2-93373, H-2-93374 (W-030UPGRADE H-2-131075)	6	
AY.12.1.8.5	Recorder (242-A)			
AY.12.2	TANK ANNULUS VENTILATION SYSTEM	H-2-64461	0	
AY.12.2.1	Annulus Diff. Pressure Subsystem	H-2-64400, H-2-64367	0	3.2.1.2.3.1
AY.13	TRANSFER LINE CONTROL SYSTEM	H-2-94029	0	1. 3.2.1.1.2.5 2. 3.2.1.1.2.8
AY.13.1	PUMP CONTROL SUBSYSTEM	H-2-70796, H-2-94029	0	1. 3.2.1.1.2.9
AY.13.2	VALVE POSITION INSTRUMENTATION/ INDICATION	N/A		1. 3.2.1.1.2.10
AY.13.3	VALVE CONTROL SYSTEM	N/A		1. 3.2.1.1.2.10
AY.13.4	PRESSURE SWITCH INSTRUMENTATION (Flow Indication)	N/A		1. 3.2.1.1.2.9
AY.13.5	WASTE FLOW MONITORING INSTRUMENTATION (Service Pnt & Flush Pnt)	N/A		1. 3.2.1.1.2.11
AY.13.5.1	Service Pnt Instrument Subsystems	N/A		

EXISTING TANK FARM EQUIPMENT SYSTEM DRAWING REFERENCES INSTRUMENTS & CONTROL SYSTEMS				
REF NO.	SYSTEM NAME	DRAWING REFERENCES	NO. OF ECNs OUTSTANDING	PDRD REFERENCE
AY.13.5.1.1	Flow Monitor & Totalizer	N/A		
AY.13.5.1.2	Radiation (Gamma) Monitor	N/A		
AY.13.5.1.3	Pipeline Pressure Sensor	N/A		
AY.14	TANK CONTENTS MONITORING SYSTEM			1. 3.2.1.1.2.6
AY.14.1	TEMPERATURE/VAPOR INSTRUMENTATION	H-2-64400, H-2-64366	0	1. 3.2.1.1.1.9 2. 3.2.1.1.1.25 3. 3.2.1.2.1.1.1
AY.14.1.1	Thermocouple Probes	H-2-64400, H-2-64366	0	
AY.14.1.2				
AY.14.1.3				
AY.14.2	STANDARD HYDROGEN MONITORING SYSTEM	N/A		1. 3.2.1.1.1.37
AY.14.2.1	Gas Flow Instrumentation	N/A		
AY.14.2.2	H ₂ Concentration - Low Range Instrumentation	N/A		
AY.14.2.3	H ₂ Concentration - High Range Instrumentation	N/A		
AY.14.2.4	Gas Temperature Instrumentation	N/A		
AY.14.2.5	3 Pen Recorder	N/A		
AY.14.3	CHEMICAL COMPOSITION MONITORING	N/A		1. 3.2.1.1.1.1 2. 3.2.1.1.1.2.1.1 3. 3.2.1.1.1.2.1.2
AY.14.3.1	Weight Factor & Loop Seal Instrumentation	H-2-64400	0	1. 3.2.1.1.1.2.1.2
AY.14.4	TANK LIQUID SURFACE LEVEL INSTRUMENTATION	H-2-64400	0	1. 3.2.1.1.1.5 2. 3.2.1.1.1.13 3. 3.2.1.1.2.12
AY.14.4.1	FIC/Enraf Riser Extension	H-2-36382 (FIC), H-2-817634 (ENRAF)	45	
AY.14.4.2	FIC/Enraf Level Sensor	H-2-36382 (FIC), H-2-817634 (ENRAF)	45	

EXISTING TANK FARM EQUIPMENT SYSTEM DRAWING REFERENCES INSTRUMENTS & CONTROL SYSTEMS				
REF NO.	SYSTEM NAME	DRAWING REFERENCES	NO. OF ECNs OUTSTANDING	PORD REFERENCE
AY.14.4.4	reserved			
AY.14.4.4	Signal Cables/Terminal Boxes	H-2-36378, H-2-36382 (FIC), H-2-817634 (ENRAF)	48	
AY.14.4.5	Enraf/CASS Digital Interface	H-2-71801, H-2-71802, H-2-71803 (FIC)	6	
AY.14.5	SLUDGE WEIGHT (LEVEL) MONITORING	H-2-64377	1	
AY.15	TANK CONTENTS MIXING & HEATING SYSTEMS			
AY.15.1	AIR LIFT CIRCULATOR CONTROL SYSTEM	H-2-64400	0	
AY.15.1.1	Diff. Pressure Sensors	H-2-64400	0	
AY.15.1.2	Local Indication	H-2-64400	0	
AY.15.1.3	Flow Cutoff Valve	H-2-64400	0	
AY.15.3	STEAM HEAT CONTROL / INSTRUMENTATION	H-2-64400	0	
AY.16	SCC STATUS/MONITORING SYSTEM			1. 3.2.1.1.2.1 2. 3.2.1.1.2.3
AY.16.1	AC POWER SUPPLY STATUS INST.	H-2-64340	0	
AY.16.2	AIR SUPPLY STATUS INST.	H-2-68335	0	
AY.16.3	WATER SUPPLY STATUS INST.	H-2-68335	0	
AY.16.4	TANK CONCRETE STRUCTURE TEMPERATURE INST.	H-2-64400	0	1. 3.2.1.1.1.29 2. 3.2.1.2.1.2
AY.16.4.1	Data Logger (See CASS Assessment)	H-2-64400, H-2-64365	2	
AY.16.4.2	Manual Readout Panel	N/A - HANDHELD ONLY		
AY.16.4.3	Signal Wiring/Terminal Boxes	H-2-64366	0	
AY.16.5	HEAT TRACE SYSTEM STATUS INST.	H-2-70797	0	
AY.16.6	CATHODIC PROTECTION SYSTEM STATUS INST.	H-2-77321, H-2-77322 (W-030 UPGRADE H-2-131378)	0	

EXISTING TANK FARM EQUIPMENT SYSTEM DRAWING REFERENCES INSTRUMENTS & CONTROL SYSTEMS				
REF NO.	SYSTEM NAME	DRAWING REFERENCES	NO. OF ECNs OUTSTANDING	PDRD REFERENCE
AY.17	HEAT TRACE CONTROL SYSTEM	H-2-70797	0	1. 3.2.1.3
AY.17.1	TEMPERATURE MONITORING SENSORS	H-2-70797	0	
AY.17.2	TEMP. CONTROLLER SUBSYSTEM	H-2-70797	0	
AY.17.3	OVER TEMP. CONTROLLER SUBSYSTEM	H-2-70797	0	
AY.17.4	HEATER CONTACTOR- OTHER WIRING	H-2-70797	0	
AY.17.5	PIPELINE HEAT TRACE TAPE HEATER	H-2-70797	0	
AY.18	CATHODIC PROTECTION CONTROL SYSTEM	H-2-77321, H-2-77322 (W-030 UPGRADE H-2-131378)	0	1. 3.2.1.3.5 2. Testing requirement
AY.18.1	POWER CONTROLLER	H-2-77321, H-2-77322 (W-030 UPGRADE H-2-131378)	0	
AY.18.2	WIRING/CONDUIT/TBX	H-2-77321, H-2-77322 (W-030 UPGRADE H-2-131378)	0	

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6.5 Special Testing

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6.6 Field Assessment Questionnaire

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EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS			
REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AY.II	LEAK CONTROL SYSTEM		
AY.II.1	LEAK DET. PIT/SUMP INST.		
AY.II.1.1	Gamma Radiation Monitoring Subsystem	<p>Inspect instrument cables where accessible. Inspect wiring where accessible. Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.</p>	
AY.II.1.1.1	<i>Gamma Probe Well Structure</i>		"Cover plate is not sealed and water accumulates in well from infiltration and condensation".
AY.II.1.1.2	<i>Gamma Probe & Well Cable</i>		"Coaxial cable is subject to failure from excessive moisture".
AY.II.1.1.3	<i>Field Signal Cable</i>		"Coaxial cable is subject to failure from excessive moisture".
AY.II.1.1.4	<i>reserved</i>		
AY.II.1.1.5	<i>Count Rate Meters/ Alarm Comparators.</i>		<p>"Estimated age of equipment: 15 years" "Equipment is removed for shop calibration at 6 month intervals".</p>
AY.II.1.2	Weight Factor & Specific Gravity Monitoring Subsystem	<p>Inspect instrument cables where accessible. Inspect wiring where accessible. Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.</p>	"The instrument air supply supplies wet, dirty, air".
AY.II.1.2.1	<i>Sample Tubes (Leak Det. Pit)</i>		"Good condition".
AY.II.1.2.2	<i>Weight Factor & Specific Gravity Pressure Sensors</i>		<p>"Estimated age of equipment is 15 years". "Appear to be in good condition".</p>

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS				FINDINGS/COMMENTS
REF. NO.	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION		
AY.11	LEAK CONTROL SYSTEM			
AY.11.1	LEAK DET. PIT/SUMP INST.			
AY.11.1.1	Gamma Radiation Monitoring Subsystem	<p>Inspect instrument cables where accessible.</p> <p>Inspect wiring where accessible.</p> <p>Inspect instrument tubing where accessible.</p> <p>Inspect instrument and cabinets/terminal boxes for corrosion.</p> <p>Estimate age of equipment.</p> <p>Estimate maintenance repair frequency for equipment.</p> <p>Determine method of calibration and determine if equipment can be calibrated.</p> <p>Determine known continuous problems (operating or maintenance) with the equipment.</p> <p>Take photographs of equipment to illustrate problem areas.</p>		
AY.11.1.1.1	Gamma Probe Well Structure			"Cover plate is not sealed and water accumulates in well from infiltration and condensation"
AY.11.1.1.2	Gamma Probe & Well Cable			"Coaxial cable is subject to failure from excessive moisture"
AY.11.1.1.3	Field Signal Cable			"Coaxial cable is subject to failure from excessive moisture"
AY.11.1.1.4	reserved			
AY.11.1.1.5	Count Rate Meters/ Alarm Comparators.			<p>"Estimated age of equipment: 15 years"</p> <p>"Equipment is removed for shop calibration at 6 month intervals"</p>
AY.11.1.2.3	Weight Factor Cabinet			<p>"Cabinet doors do not seal properly allowing dirt to infiltrate the cabinet"</p> <p>"Climate control not very effective - resistance heater which sometimes does not work in winter, no cooling capacity for summertime heat"</p>
AY.11.1.2.4	Field Tubing			<p>"Tubing is routed in buried tubing from remote cabinets to 801 bldg"</p> <p>"Tubing appears to be in good condition but has been filled with water and debris from condensation of the instrument air system"</p>
AY.11.1.2.5	W.F. & SpG Pressure Switches & Indicators (Inst. Panel & Press. SW Rack)			<p>"Estimated age of equipment is 15 years"</p> <p>"Low repair rate"</p> <p>"Calibration on annual rotation, performed in the field at 1 hour per instrument"</p> <p>"No recurrent problems"</p> <p>"Equipment difficult to access"</p>

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS			
REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AY.11	LEAK CONTROL SYSTEM		
AY.11.1	LEAK DET. PIT/SUMP INST.		
AY.11.1.1	Gamma Radiation Monitoring Subsystem	Inspect instrument cables where accessible. Inspect wiring where accessible. Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	
AY.11.1.1.1	<i>Gamma Probe Well Structure</i>		"Cover plate is not sealed and water accumulates in well from infiltration and condensation".
AY.11.1.1.2	<i>Gamma Probe & Well Cable</i>		"Coaxial cable is subject to failure from excessive moisture".
AY.11.1.1.3	<i>Field Signal Cable</i>		"Coaxial cable is subject to failure from excessive moisture".
AY.11.1.1.4	<i>reserved</i>		
AY.11.1.1.5	<i>Count Rate Meters/ Alarm Comparators.</i>		"Estimated age of equipment: 15 years". "Equipment is removed for shop calibration at 6 month intervals".
AY.11.1.3	Liquid Presence Sensor and Buried wiring	Inspect wiring where accessible. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Equipment not available for inspection".
AY.11.1.4	Liquid Temperature Sensor	Inspect wiring where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Take photographs of equipment to illustrate problem areas.	

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS				FINDINGS/COMMENTS
REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION		
AY.11	LEAK CONTROL SYSTEM			
AY.11.1	LEAK DET. PIT/SUMP INST.			
AY.11.1.1	Gamma Radiation Monitoring Subsystem	<p>Inspect instrument cables where accessible.</p> <p>Inspect wiring where accessible.</p> <p>Inspect instrument tubing where accessible.</p> <p>Inspect equipment and cabinets/terminal boxes for corrosion.</p> <p>Estimate age of equipment.</p> <p>Estimate maintenance repair frequency for equipment.</p> <p>Determine method of calibration and determine if equipment can be calibrated.</p> <p>Determine known continuous problems (operating or maintenance) with the equipment.</p> <p>Take photographs of equipment to illustrate problem areas.</p>		
AY.11.1.1.1	Gamma Probe Well Structure			"Cover plate is not sealed and water accumulates in well from infiltration and condensation"
AY.11.1.1.2	Gamma Probe & Well Cable			"Coaxial cable is subject to failure from excessive moisture"
AY.11.1.1.3	Field Signal Cable			"Coaxial cable is subject to failure from excessive moisture"
AY.11.1.1.4	reserved			
AY.11.1.1.5	Count Rate Meters/ Alarm Comparators.			"Estimated age of equipment: 15 years". "Equipment is removed for shop calibration at 6 month intervals."
AY.11.2	ANNULUS LEAK INSTRUMENTATION			"Leak detection is provided by two separate systems: 1) Continuous air monitor 2) Continuity probe"
AY.11.2.1	Annulus CAM Radiation Monitoring Subsystem	<p>Inspect instrument cables where accessible.</p> <p>Inspect wiring where accessible.</p> <p>Inspect instrument tubing where accessible.</p> <p>Inspect equipment and cabinets/terminal boxes for corrosion.</p> <p>Estimate age of equipment.</p> <p>Estimate maintenance repair frequency for equipment.</p> <p>Determine method of calibration and determine if equipment can be calibrated.</p> <p>Determine known continuous problems (operating or maintenance) with the equipment.</p> <p>Take photographs of equipment to illustrate problem areas.</p>		
AY.11.2.1.1	Air Sampler Probe/ Tubing/ etc			"Stainless Steel tubing in good condition"

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS			
REF. NO.	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AY.11	LEAK CONTROL SYSTEM		
AY.11.1	LEAK DET. P/T/SUMP INST.		
AY.11.1.1	Gamma Radiation Monitoring Subsystem	<p>Inspect instrument cables where accessible.</p> <p>Inspect wiring where accessible.</p> <p>Inspect instrument tubing where accessible.</p> <p>Inspect equipment and cabinets/terminal boxes for corrosion.</p> <p>Estimate age of equipment.</p> <p>Estimate maintenance repair frequency for equipment.</p> <p>Determine method of calibration and determine if equipment can be calibrated.</p> <p>Determine known continuous problems (operating or maintenance) with the equipment.</p> <p>Take photographs of equipment to illustrate problem areas.</p>	
AY.11.1.1.1	Gamma Probe Well Structure		"Cover plate is not sealed and water accumulates in well from infiltration and condensation".
AY.11.1.1.2	Gamma Probe & Well Cable		"Coaxial cable is subject to failure from excessive moisture".
AY.11.1.1.3	Field Signal Cable		"Coaxial cable is subject to failure from excessive moisture".
AY.11.1.1.4	reserved		
AY.11.1.1.5	Count Rate Meters/ Alarm Comparators.		<p>"Estimated age of equipment: 15 years".</p> <p>"Equipment is removed for shop calibration at 6 month intervals".</p>
AY.11.2.1.2	Radiation Analyzer		<p>"Estimated age of equipment is 15 years".</p> <p>"Low repair rate"</p> <p>"Calibration is on an annual rotation, performed in the shop at 8 hours per instrument.</p> <p>"CAM unit is in excess of 160 lbs and is hand moved to transport to the shop for calibration".</p>
AY.11.2.1.3	Cabinet s		<p>"Doors do not fit properly allowing dust infiltration".</p> <p>"Poor climate control - hot in summer and cold in winter".</p>
AY.11.2.1.4	Recorder & Alarms		<p>"Estimated age of equipment is 15 years".</p> <p>"Alarms are relayed off of field sensor".</p> <p>"High maintenance required to keep recorders serviceable".</p>
AY.11.2.1.5	Signal Wiring/ Conduit		"Signal wiring is in good condition but is not well marked or documented for tracing".

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS			
REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AY.11	LEAK CONTROL SYSTEM		
AY.11.1	LEAK DET. PIT/SUMP INST.		
AY.11.1.1	Gamma Radiation Monitoring Subsystem	<p>Inspect instrument cables where accessible.</p> <p>Inspect wiring where accessible.</p> <p>Inspect instrument tubing where accessible.</p> <p>Inspect equipment and cabinets/terminal boxes for corrosion.</p> <p>Estimate age of equipment.</p> <p>Determine maintenance repair frequency for equipment.</p> <p>Determine method of calibration and determine if equipment can be calibrated.</p> <p>Determine known continuous problems (operating or maintenance) with the equipment.</p> <p>Take photographs of equipment to illustrate problem areas.</p>	
AY.11.1.1.1	Gamma Probe Well Structure		"Cover plate is not sealed and water accumulates in well from infiltration and condensation".
AY.11.1.1.2	Gamma Probe & Well Cable		"Coaxial cable is subject to failure from excessive moisture".
AY.11.1.1.3	Field Signal Cable		"Coaxial cable is subject to failure from excessive moisture".
AY.11.1.1.4	reserved		
AY.11.1.1.5	Count Rate Meters/ Alarm Computers.		"Estimated age of equipment: 15 years". "Equipment is removed for shop calibration at 6 month intervals".
AY.11.2.2	Annulus Liquid Presence Sensor (Flare Box & Manual Tape Conductivity Probe)	<p>Inspect wiring where accessible.</p> <p>Inspect instrument tubing where accessible.</p> <p>Inspect equipment and cabinets/terminal boxes for corrosion.</p> <p>Estimate age of equipment.</p> <p>Determine maintenance repair frequency for equipment.</p> <p>Determine method of calibration and determine if equipment can be calibrated.</p> <p>Determine known continuous problems (operating or maintenance) with the equipment.</p> <p>Take photographs of equipment to illustrate problem areas.</p>	"Out of service".
AY.11.2.3	Annulus Pump Pit Liquid Presence Sensor	See AY.11.3.3	"Continuity probe". "Function check monthly at 1/2 hour per instrument".
AY.11.3	PIPELINE LEAK INSTRUMENTATION		

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS			
REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AY.11	LEAK CONTROL SYSTEM		
AY.11.1	LEAK DET. PIT/SUMP INST.		
AY.11.1.1	Gamma Radiation Monitoring Subsystem	Inspect instrument cables where accessible. Inspect wiring where accessible. Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	
AY.11.1.1.1	<i>Gamma Probe Well Structure</i>		"Cover plate is not sealed and water accumulates in well from infiltration and condensation"
AY.11.1.1.2	<i>Gamma Probe & Well Cable</i>		"Coaxial cable is subject to failure from excessive moisture"
AY.11.1.1.3	<i>Field Signal Cable</i>		"Coaxial cable is subject to failure from excessive moisture"
AY.11.1.1.4	<i>reserved</i>		
AY.11.1.1.5	<i>Count Rate Meters/ Alarm Comparators.</i>		"Estimated age of equipment: 15 years" "Equipment is removed for shop calibration at 6 month intervals"
AY.11.3.1	C.O.B. Liquid Presence Sensor	See AY.11.3.3	"Estimated age 15 years" "No Calibration - Function tests performed monthly or bimonthly"
AY.11.3.2	Pipeline Pressure Switch Sensor	See AY.11.3.3	
AY.11.3.3	Transfer Pit Instruments (LDE only)	Inspect wiring where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	
AY.11.3.3.1	<i>Pit Liquid Presence Sensor</i>		"No access to sensor"

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS			
REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AY.11	LEAK CONTROL SYSTEM		
AY.11.1	LEAK DET. PIT/SUMP INST.		
AY.11.1.1	Gamma Radiation Monitoring Subsystem	Inspect instrument cables where accessible. Inspect wiring where accessible. Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	
AY.11.1.1.1	<i>Gamma Probe Well Structure</i>		"Cover plate is not sealed and water accumulates in well from infiltration and condensation".
AY.11.1.1.2	<i>Gamma Probe & Well Cable</i>		"Coaxial cable is subject to failure from excessive moisture".
AY.11.1.1.3	<i>Field Signal Cable</i>		"Coaxial cable is subject to failure from excessive moisture".
AY.11.1.1.4	<i>reserved</i>		
AY.11.1.1.5	<i>Count Rate Meters/ Alarm Comparators.</i>		"Estimated age of equipment: 15 years". "Equipment is removed for shop calibration at 6 month intervals".
AY.11.3.2	<i>reserved</i>		
AY.11.3.3	<i>Pit Signal Wiring/Conduit/TBX</i>		"Good condition".
AY.11.3.4	Field Signal Wiring/ Conduit/ Terminal Boxes		"Estimated age of equipment 20 years". "The weather tight integrity of terminal boxes is poor. Terminals are subject to fouling from dust and humidity".
AY.11.3.5	Encasement Leak Detection Pit Instruments (AZ farm only)	See AY.11.3.3	"Monthly PM 1/2 hour per instrument". "No calibration possible".
AY.11.4	PUMP PERMISSIVE INSTRUMENTATION (Master Pump shutdown)		

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS			
REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AY.II	LEAK CONTROL SYSTEM		
AY.II.1	LEAK DET. PIT/SUMP INST.		
AY.II.1.1	Gamma Radiation Monitoring Subsystem	<p>Inspect instrument cables where accessible.</p> <p>Inspect wiring where accessible.</p> <p>Inspect instrument tubing where accessible.</p> <p>Inspect equipment and cabinets/terminal boxes for corrosion.</p> <p>Estimate age of equipment.</p> <p>Estimate maintenance repair frequency for equipment.</p> <p>Determine method of calibration and determine if equipment can be calibrated.</p> <p>Determine known continuous problems (operating or maintenance) with the equipment.</p> <p>Take photographs of equipment to illustrate problem areas.</p>	
AY.II.1.1.1	Gamma Probe Well Structure		"Cover plate is not sealed and water accumulates in well from infiltration and condensation".
AY.II.1.1.2	Gamma Probe & Well Cable		"Coaxial cable is subject to failure from excessive moisture".
AY.II.1.1.3	Field Signal Cable		"Coaxial cable is subject to failure from excessive moisture".
AY.II.1.1.4	reserved		
AY.II.1.1.5	Count Rate Meters/ Alarm Comparators.		<p>"Estimated age of equipment: 15 years".</p> <p>"Equipment is removed for shop calibration at 6 month intervals".</p>
AY.II.4.1	Master Pump Shutdown Relay Panel	<p>Inspect instrument cables where accessible.</p> <p>Inspect wiring where accessible.</p> <p>Inspect equipment and cabinets/terminal boxes for corrosion.</p> <p>Estimate age of equipment.</p> <p>Estimate maintenance repair frequency for equipment.</p> <p>Determine method of calibration and determine if equipment can be calibrated.</p> <p>Determine known continuous problems (operating or maintenance) with the equipment.</p> <p>Take photographs of equipment to illustrate problem areas.</p>	<p>"Wiring is in good condition within relay panel".</p> <p>"Estimated age of equipment is 20 years".</p> <p>"Maintenance history unknown".</p> <p>"Prints need to be updated for better reliability of maintenance".</p>
AY.II.4.2	MPS Pushbutton Control Panel		
AY.II.4.3	Signal Wiring/Conduit/TBX		"Wiring is in good condition".

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS			
REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AY.11	LEAK CONTROL SYSTEM		
AY.11.1	LEAK DET. PIT/SUMP INST.		
AY.11.1.1	Gamma Radiation Monitoring Subsystem	<p>Inspect instrument cables where accessible. Inspect wiring where accessible. Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.</p>	
AY.11.1.1.1	<i>Gamma Probe Well Structure</i>		"Cover plate is not sealed and water accumulates in well from infiltration and condensation".
AY.11.1.1.2	<i>Gamma Probe & Well Cable</i>		"Coaxial cable is subject to failure from excessive moisture".
AY.11.1.1.3	<i>Field Signal Cable</i>		"Coaxial cable is subject to failure from excessive moisture".
AY.11.1.1.4	<i>reserved</i>		
AY.11.1.1.5	<i>Count Rate Meters/ Alarm Comparators.</i>		"Estimated age of equipment: 15 years". "Equipment is removed for shop calibration at 6 month intervals".
AY.11.4.4	[242-A Relay Panel]	<p>Inspect instrument cables where accessible. Inspect wiring where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.</p>	"Good condition".

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS				
REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS	
AY.II	LEAK CONTROL SYSTEM			
AY.II.1	LEAK DET. PIT/SUMP INST.			
AY.II.1.1	Gamma Radiation Monitoring Subsystem	Inspect instrument cables where accessible. Inspect wiring where accessible. Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.		
AY.II.1.1.1	<i>Gamma Probe Well Structure</i>		"Cover plate is not sealed and water accumulates in well from infiltration and condensation"	
AY.II.1.1.2	<i>Gamma Probe & Well Cable</i>		"Coaxial cable is subject to failure from excessive moisture"	
AY.II.1.1.3	<i>Field Signal Cable</i>		"Coaxial cable is subject to failure from excessive moisture"	
AY.II.1.1.4	<i>reserved</i>			
AY.II.1.1.5	<i>Count Rate Meters/ Alarm Comparators.</i>		"Estimated age of equipment: 15 years" "Equipment is removed for shop calibration at 6 month intervals"	
AY.II.5	LOCAL ALARM ANNUNCIATION PANELS	Inspect instrument cables where accessible. Inspect wiring where accessible. Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.		
AY.II.5.1	241-A-271 Alarm Panel		"Good condition" "Estimated age of equipment 20 years"	
AY.II.5.2	241-AY-801 Alarm Panel		"Good condition"	

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS				FINDINGS/COMMENTS
REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION		
AY.II	LEAK CONTROL SYSTEM			
AY.II.1	LEAK DET. PIT/SUMP INST.			
AY.II.1.1	Gamma Radiation Monitoring Subsystem	<p>Inspect instrument cables where accessible.</p> <p>Inspect wiring where accessible.</p> <p>Inspect instrument tubing where accessible.</p> <p>Inspect equipment and cabinets/terminal boxes for corrosion.</p> <p>Estimate age of equipment.</p> <p>Estimate maintenance repair frequency for equipment.</p> <p>Determine method of calibration and determine if equipment can be calibrated.</p> <p>Determine known continuous problems (operating or maintenance) with the equipment.</p> <p>Take photographs of equipment to illustrate problem areas.</p>		
AY.II.1.1.1	Gamma Probe Well Structure		"Cover plate is not sealed and water accumulates in well from infiltration and condensation".	
AY.II.1.1.2	Gamma Probe & Well Cable		"Coaxial cable is subject to failure from excessive moisture".	
AY.II.1.1.3	Field Signal Cable		"Coaxial cable is subject to failure from excessive moisture".	
AY.II.1.1.4	reserved			
AY.II.1.1.5	Count Rate Meters/ Alarm Comparators.		<p>"Estimated age of equipment: 15 years".</p> <p>"Equipment is removed for shop calibration at 6 month intervals".</p>	
AY.II.5.3	CASS Alarm Panel Interface			
AY.II.6	REMOTE ALARM SIGNALING (GAMEWELL LOOP)		"Removed from service".	
AY.II.7	TANK WASTE HIGH LEVEL ALARM SUBSYSTEM	<p>Inspect wiring where accessible.</p> <p>Inspect equipment and cabinets/terminal boxes for corrosion.</p> <p>Estimate age of equipment.</p> <p>Estimate maintenance repair frequency for equipment.</p> <p>Determine method of calibration and determine if equipment can be calibrated.</p> <p>Determine known continuous problems (operating or maintenance) with the equipment.</p> <p>Take photographs of equipment to illustrate problem areas.</p>		
AY.II.7.1	Waste Liquid High Level Probe		"No maintenance being performed".	

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS			
REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AY.11	LEAK CONTROL SYSTEM		
AY.11.1	LEAK DET. PIT/SUMP INST.		
AY.11.1.1	Gamma Radiation Monitoring Subsystem	<p>Inspect instrument cables where accessible.</p> <p>Inspect wiring where accessible.</p> <p>Inspect instrument tubing where accessible</p> <p>Inspect equipment and cabinets/terminal boxes for corrosion.</p> <p>Estimate age of equipment.</p> <p>Estimate maintenance repair frequency for equipment.</p> <p>Determine method of calibration and determine if equipment can be calibrated.</p> <p>Determine known continuous problems (operating or maintenance) with the equipment.</p> <p>Take photographs of equipment to illustrate problem areas.</p>	
AY.11.1.1.1	<i>Gamma Probe Well Structure</i>		"Cover plate is not sealed and water accumulates in well from infiltration and condensation".
AY.11.1.1.2	<i>Gamma Probe & Well Cable</i>		"Coaxial cable is subject to failure from excessive moisture".
AY.11.1.1.3	<i>Field Signal Cable</i>		"Coaxial cable is subject to failure from excessive moisture".
AY.11.1.1.4	<i>reserved</i>		
AY.11.1.1.5	<i>Count Rate Meters/ Alarm Comparators.</i>		"Estimated age of equipment: 15 years" "Equipment is removed for shop calibration at 6 month intervals".
AY.11.7.2	Tank Farm Alarm Panels		"Good condition".
AY.11.7.3	Signal Wiring/Conduit/TBX		"Good condition". "Estimated age of equipment 20 years".
AY.12	VENTILATION CONTROL SYSTEM		
AY.12.1	TANK PRIMARY VENTILATION SYSTEM		

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS				FINDINGS/COMMENTS
REF. NO.	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION		
AY.11	LEAK CONTROL SYSTEM			
AY.11.1	LEAK DET. PIT/SUMP INST.			
AY.11.1.1	Gamma Radiation Monitoring Subsystem	<p>Inspect instrument cables where accessible.</p> <p>Inspect wiring where accessible.</p> <p>Inspect instrument tubing where accessible.</p> <p>Inspect equipment and cabinets/terminal boxes for corrosion.</p> <p>Estimate age of equipment.</p> <p>Estimate maintenance repair frequency for equipment.</p> <p>Determine method of calibration and determine if equipment can be calibrated.</p> <p>Determine known continuous problems (operating or maintenance) with the equipment.</p> <p>Take photographs of equipment to illustrate problem areas.</p>		
AY.11.1.1.1	Gamma Probe Well Structure		"Cover plate is not sealed and water accumulates in well from infiltration and condensation".	
AY.11.1.1.2	Gamma Probe & Well Cable		"Coaxial cable is subject to failure from excessive moisture".	
AY.11.1.1.3	Field Signal Cable		"Coaxial cable is subject to failure from excessive moisture".	
AY.11.1.1.4	reserved			
AY.11.1.1.5	Count Rate Meters/ Alarm Comparators.		<p>"Estimated age of equipment: 15 years".</p> <p>"Equipment is removed for shop calibration at 6 month intervals".</p>	
AY.12.1.1	Tank Diff. Pressure Inst. Subsystem	<p>Inspect wiring where accessible.</p> <p>Inspect instrument tubing where accessible.</p> <p>Inspect equipment and cabinets/terminal boxes for corrosion.</p> <p>Estimate age of equipment.</p> <p>Estimate maintenance repair frequency for equipment.</p> <p>Determine method of calibration and determine if equipment can be calibrated.</p> <p>Determine known continuous problems (operating or maintenance) with the equipment.</p> <p>Take photographs of equipment to illustrate problem areas.</p>	"Estimated age of equipment 20 years".	
AY.12.1.1.1	Tank Rice Tubing to Pressure Sensor/Transmitter		"Good condition".	
AY.12.1.1.2	Pressure Sensor/Transmitter		"No remote readout capability".	
AY.12.1.1.3	Field Instrument Air Tubing		"Black poly tubing not conducive to proper maintenance".	

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS			
REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AY.11	LEAK CONTROL SYSTEM		
AY.11.1	LEAK DET. PIT/SUMP INST.		
AY.11.1.1	Gamma Radiation Monitoring Subsystem	<p>Inspect instrument cables where accessible.</p> <p>Inspect wiring where accessible.</p> <p>Inspect instrument tubing where accessible.</p> <p>Inspect equipment and cabinets/terminal boxes for corrosion.</p> <p>Estimate age of equipment.</p> <p>Estimate maintenance repair frequency for equipment.</p> <p>Determine method of calibration and determine if equipment can be calibrated.</p> <p>Determine known continuous problems (operating or maintenance) with the equipment.</p> <p>Take photographs of equipment to illustrate problem areas.</p>	
AY.11.1.1.1	Gamma Probe Well Structure		"Cover plate is not sealed and water accumulates in well from infiltration and condensation".
AY.11.1.1.2	Gamma Probe & Well Cable		"Coaxial cable is subject to failure from excessive moisture".
AY.11.1.1.3	Field Signal Cable		"Coaxial cable is subject to failure from excessive moisture".
AY.11.1.1.4	reserved		
AY.11.1.1.5	Count Rate Meters/ Alarm Comparators.		"Estimated age of equipment: 15 years". "Equipment is removed for shop calibration at 6 month intervals".
AY.12.1.1.4	Pressure Switch/Alarm		"Estimated age of equipment is 20 years". "Low repair rate". "Calibration on annual rotation. Performed in the field at 1 hour per instrument".
AY.12.1.1.5	Pressure Recorder		"Estimated age of equipment is 20 years". "Requires frequent maintenance".
AY.12.1.2	HEPA Filter Diff. Pressure Instr.	<p>Inspect wiring where accessible.</p> <p>Inspect instrument tubing where accessible.</p> <p>Estimate age of equipment.</p> <p>Inspect equipment and cabinets/terminal boxes for corrosion.</p> <p>Estimate maintenance repair frequency for equipment.</p> <p>Determine method of calibration and determine if equipment can be calibrated.</p> <p>Determine known continuous problems (operating or maintenance) with the equipment.</p> <p>Take photographs of equipment to illustrate problem areas.</p>	<p>"Estimated age of equipment is 20 years".</p> <p>"Gauges are replaced frequently (2-3 years)".</p> <p>"Calibration performed annually in the field at 30 minutes per instrument".</p>

**EXISTING TANK FARM EQUIPMENT
FIELD ASSESSMENT TABLE
INSTRUMENTS & CONTROL SYSTEMS**

REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AY.11	LEAK CONTROL SYSTEM		
AY.11.1	LEAK DET. PIT/SUMP INST.		
AY.11.1.1	Gamma Radiation Monitoring Subsystem	<p>Inspect instrument cables where accessible.</p> <p>Inspect wiring where accessible.</p> <p>Inspect instrument tubing where accessible.</p> <p>Inspect equipment and cabinets/terminal boxes for corrosion.</p> <p>Estimate age of equipment.</p> <p>Estimate maintenance repair frequency for equipment.</p> <p>Determine method of calibration and determine if equipment can be calibrated.</p> <p>Determine known continuous problems (operating or maintenance) with the equipment.</p> <p>Take photographs of equipment to illustrate problem areas.</p>	
AY.11.1.1.1	<i>Gamma Probe Well Structure</i>		"Cover plate is not sealed and water accumulates in well from infiltration and condensation".
AY.11.1.1.2	<i>Gamma Probe & Well Cable</i>		"Coaxial cable is subject to failure from excessive moisture".
AY.11.1.1.3	<i>Field Signal Cable</i>		"Coaxial cable is subject to failure from excessive moisture".
AY.11.1.1.4	<i>reserved</i>		
AY.11.1.1.5	<i>Count Rate Meters/ Alarm Comparators.</i>		"Estimated age of equipment: 15 years" "Equipment is removed for shop calibration at 6 month intervals".
AY.12.1.3	Temperature Instrumentation		"Estimated age of equipment is 20 years" "Frequent maintenance"
AY.12.1.4	Heater Control Subsystem	<p>Inspect wiring where accessible.</p> <p>Inspect equipment and cabinets/terminal boxes for corrosion.</p> <p>Estimate age of equipment.</p> <p>Estimate maintenance repair frequency for equipment.</p> <p>Determine method of calibration and determine if equipment can be calibrated.</p> <p>Determine known continuous problems (operating or maintenance) with the equipment.</p> <p>Take photographs of equipment to illustrate problem areas.</p>	"Estimated age of equipment is 20 years" "Frequent maintenance" "6 month calibration rotation 1 hour per calibration".
AY.12.1.5	Fan-Motor Control Subsystem		"Fan speed adjusted manually".
AY.12.1.6	Damper Control Subsystem		"Dampers adjusted manually".

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS				FINDINGS/COMMENTS
REF. NO.	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION		
AY.11	LEAK CONTROL SYSTEM			
AY.11.1	LEAK DET. PIT/SUMP INST.			
AY.11.1.1	Gamma Radiation Monitoring Subsystem	Inspect instrument cables where accessible. Inspect wiring where accessible. Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.		
AY.11.1.1.1	<i>Gamma Probe Well Structure</i>			"Cover plate is not sealed and water accumulates in well from infiltration and condensation"
AY.11.1.1.2	<i>Gamma Probe & Well Cable</i>			"Coaxial cable is subject to failure from excessive moisture"
AY.11.1.1.3	<i>Field Signal Cable</i>			"Coaxial cable is subject to failure from excessive moisture"
AY.11.1.1.4	<i>reserved</i>			
AY.11.1.1.5	<i>Count Rate Meters/ Alarm Comparators.</i>			"Estimated age of equipment: 15 years" "Equipment is removed for shop calibration at 6 month intervals."
AY.12.1.8	Regulated Stack Monitoring System ()	Inspect instrument cables where accessible. Inspect wiring where accessible. Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.		
AY.12.1.8.1	<i>Tubing from Stack to CAM</i>			"Stainless in good condition"

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS			
REF. NO.	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AY-11	LEAK CONTROL SYSTEM		
AY-11.1	LEAK DET. PIT/SUMP INST.		
AY-11.1.1	Gamma Radiation Monitoring Subsystem	<p>Inspect instrument cables where accessible.</p> <p>Inspect wiring where accessible.</p> <p>Inspect instrument tubing where accessible.</p> <p>Inspect equipment and cabinets/terminal boxes for corrosion.</p> <p>Estimate age of equipment.</p> <p>Estimate maintenance repair frequency for equipment.</p> <p>Determine method of calibration and determine if equipment can be calibrated.</p> <p>Determine known continuous problems (operating or maintenance) with the equipment.</p> <p>Take photographs of equipment to illustrate problem areas.</p>	
AY-11.1.1.1	<i>Gamma Probe Well Structure</i>		"Cover plate is not sealed and water accumulates in well from infiltration and condensation".
AY-11.1.1.2	<i>Gamma Probe & Well Cable</i>		"Coaxial cable is subject to failure from excessive moisture".
AY-11.1.1.3	<i>Field Signal Cable</i>		"Coaxial cable is subject to failure from excessive moisture".
AY-11.1.1.4	<i>reserved</i>		
AY-11.1.1.5	<i>Count Rate Meters/ Alarm Comparators.</i>		<p>"Estimated age of equipment: 15 years".</p> <p>"Equipment is removed for shop calibration at 6 month intervals".</p>
AY-12.1.8.2	<i>CAMs Radiation Analyzers</i>		<p>"CAM is calibrated yearly in shop at 8 hours per instrument".</p> <p>"CAM weights in excess of 160 pounds and are hard to access for removal from the cabinets for maintenance or calibration".</p> <p>"Low repair rate".</p>
AY-12.1.8.3	<i>CAM Cabinets</i>		<p>"Cabinet doors do not seal properly allowing dirt to infiltrate the cabinet".</p> <p>"Climate control is not very effective - resistance heater which sometimes does not work in winter, no cooling capacity for summertime heat".</p>
AY-12.1.8.4	<i>Vacuum Pumps</i>		<p>"Estimated age of equipment is 15 years".</p> <p>"Estimated life of pump 2 - 3 year".</p> <p>"Functional test only".</p> <p>"No known recurrent problems".</p>
AY-12.1.8.5	<i>Recorder (242-A)</i>		"Wiring showing signs of wear and aging".

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS				FINDINGS/COMMENTS
REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION		
AY.11	LEAK CONTROL SYSTEM			
AY.11.1	LEAK DET. PIT/SUMP INST.			
AY.11.1.1	Gamma Radiation Monitoring Subsystem	<p>Inspect instrument cables where accessible.</p> <p>Inspect wiring where accessible.</p> <p>Inspect instrument tubing where accessible.</p> <p>Inspect equipment and cabinets/terminal boxes for corrosion.</p> <p>Estimate age of equipment.</p> <p>Estimate maintenance repair frequency for equipment.</p> <p>Determine method of calibration and determine if equipment can be calibrated.</p> <p>Determine known continuous problems (operating or maintenance) with the equipment.</p> <p>Take photographs of equipment to illustrate problem areas.</p>	<p>"Cover plate is not sealed and water accumulates in well from infiltration and condensation".</p> <p>"Coaxial cable is subject to failure from excessive moisture".</p> <p>"Coaxial cable is subject to failure from excessive moisture".</p> <p>"Estimated age of equipment: 15 years".</p> <p>"Equipment is removed for shop calibration at 6 month intervals".</p>	
AY.11.1.1.1	Gamma Probe Well Structure			
AY.11.1.1.2	Gamma Probe & Well Cable			
AY.11.1.1.3	Field Signal Cable			
AY.11.1.1.4	reserved			
AY.11.1.1.5	Count Rate Meters/ Alarm Comparators.			
AY.12.2	TANK ANNULUS VENTILATION SYSTEM			
AY.12.2.1	Annulus Diff. Pressure Subsystem	<p>Inspect instrument tubing where accessible.</p> <p>Estimate age of equipment.</p> <p>Estimate maintenance repair frequency for equipment.</p> <p>Determine method of calibration and determine if equipment can be calibrated.</p> <p>Determine known continuous problems (operating or maintenance) with the equipment.</p> <p>Take photographs of equipment to illustrate problem areas.</p>		
AY.13	TRANSFER LINE CONTROL SYSTEM			

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS			
REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AY.11	LEAK CONTROL SYSTEM		
AY.11.1	LEAK DET. PIT/SUMP INST.		
AY.11.1.1	Gamma Radiation Monitoring Subsystem	Inspect instrument cables where accessible. Inspect wiring where accessible. Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	
AY.11.1.1.1	Gamma Probe Well Structure		"Cover plate is not sealed and water accumulates in well from infiltration and condensation"
AY.11.1.1.2	Gamma Probe & Well Cable		"Coaxial cable is subject to failure from excessive moisture"
AY.11.1.1.3	Field Signal Cable		"Coaxial cable is subject to failure from excessive moisture"
AY.11.1.1.4	reserved		
AY.11.1.1.5	Count Rate Meters/ Alarm Comparators.		"Estimated age of equipment: 15 years". "Equipment is removed for shop calibration at 6 month intervals"
AY.13.1	PUMP CONTROL SUBSYSTEM	Inspect wiring where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Estimated age of equipment 20 years"
AY.13.2	VALVE POSITION INSTRUMENTATION/ INDICATION		"Maintenance not performed on this equipment"
AY.13.3	VALVE CONTROL SYSTEM		"Valves manually operated"

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS				FINDINGS/COMMENTS
REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION		
AY.11	LEAK CONTROL SYSTEM			
AY.11.1	LEAK DET. PIT/SUMP INST.			
AY.11.1.1	Gamma Radiation Monitoring Subsystem	Inspect instrument cables where accessible. Inspect wiring where accessible. Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.		
AY.11.1.1.1	Gamma Probe Well Structure		"Cover plate is not sealed and water accumulates in well from infiltration and condensation".	
AY.11.1.1.2	Gamma Probe & Well Cable		"Coaxial cable is subject to failure from excessive moisture".	
AY.11.1.1.3	Field Signal Cable		"Coaxial cable is subject to failure from excessive moisture".	
AY.11.1.1.4	reserved			
AY.11.1.1.5	Count Rate Meters/ Alarm Comparators.		"Estimated age of equipment: 15 years". "Equipment is removed for shop calibration at 6 month intervals".	
AY.13.4	PRESSURE SWITCH INSTRUMENTATION (Flow Indication)			
AY.13.5	WASTE FLOW MONITORING INSTRUMENTATION (Service Pit & Flush Pit)	Inspect instrument cables where accessible. Inspect wiring where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.		
AY.13.5.1	Service Pit Instrument Subsystems		"Estimated age of equipment 15 years".	

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS			
REF. NO.	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AY.11	LEAK CONTROL SYSTEM		
AY.11.1	LEAK DET. PIT/SUMP INST.		
AY.11.1.1	Gamma Radiation Monitoring Subsystem	<p>Inspect instrument cables where accessible.</p> <p>Inspect wiring where accessible.</p> <p>Inspect instrument tubing where accessible.</p> <p>Inspect equipment and cabinets/terminal boxes for corrosion.</p> <p>Estimate age of equipment.</p> <p>Determine maintenance repair frequency for equipment.</p> <p>Determine method of calibration and determine if equipment can be calibrated.</p> <p>Determine known continuous problems (operating or maintenance) with the equipment.</p> <p>Take photographs of equipment to illustrate problem areas.</p>	
AY.11.1.1.1	Gamma Probe Well Structure		"Cover plate is not sealed and water accumulates in well from infiltration and condensation".
AY.11.1.1.2	Gamma Probe & Well Cable		"Coaxial cable is subject to failure from excessive moisture".
AY.11.1.1.3	Field Signal Cable		"Coaxial cable is subject to failure from excessive moisture".
AY.11.1.1.4	reserved		
AY.11.1.1.5	Count Rate Meters/ Alarm Comparators.		"Estimated age of equipment: 15 years." "Equipment is removed for shop calibration at 6 month intervals".
AY.13.5.1.1	Flow Monitor & Totalizer		"No known problems".
AY.13.5.1.2	Radiation (Gamma) Monitor		"No known problems".
AY.13.5.1.3	Pipeline Pressure Sensor		
AY.14	TANK CONTENTS MONITORING SYSTEM		

**EXISTING TANK FARM EQUIPMENT
FIELD ASSESSMENT TABLE
INSTRUMENTS & CONTROL SYSTEMS**

REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AY.11	LEAK CONTROL SYSTEM		
AY.11.1	LEAK DET. PIT/SUMP INST.		
AY.11.1.1	Gamma Radiation Monitoring Subsystem	<p>Inspect instrument cables where accessible.</p> <p>Inspect wiring where accessible.</p> <p>Inspect instrument tubing where accessible.</p> <p>Inspect equipment and cabinets/terminal boxes for corrosion.</p> <p>Estimate age of equipment.</p> <p>Determine maintenance repair frequency for equipment.</p> <p>Determine method of calibration and determine if equipment can be calibrated.</p> <p>Determine known continuous problems (operating or maintenance) with the equipment.</p> <p>Take photographs of equipment to illustrate problem areas.</p>	
AY.11.1.1.1	<i>Gamma Probe Well Structure</i>		"Cover plate is not sealed and water accumulates in well from infiltration and condensation".
AY.11.1.1.2	<i>Gamma Probe & Well Cable</i>		"Coaxial cable is subject to failure from excessive moisture".
AY.11.1.1.3	<i>Field Signal Cable</i>		"Coaxial cable is subject to failure from excessive moisture".
AY.11.1.1.4	<i>reserved</i>		
AY.11.1.1.5	<i>Count Rate Meters/ Alarm Comparators.</i>		"Estimated age of equipment: 15 years." "Equipment is removed for shop calibration at 6 month intervals".
AY.14.1	TEMPERATURE/VAPOR INSTRUMENTATION	<p>Inspect wiring where accessible.</p> <p>Inspect equipment and cabinets/terminal boxes for corrosion.</p> <p>Estimate age of equipment.</p> <p>Determine maintenance repair frequency for equipment.</p> <p>Determine method of calibration and determine if equipment can be calibrated.</p> <p>Determine known continuous problems (operating or maintenance) with the equipment.</p> <p>Take photographs of equipment to illustrate problem areas.</p>	
AY.14.1.1	Thermocouple Probes		"Estimated age of equipment 20 years". "Numerous TC Probes have failed".
AY.14.3	CHEMICAL COMPOSITION MONITORING		

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS			
REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AY.11	LEAK CONTROL SYSTEM		
AY.11.1	LEAK DET. PIT/SUMP INST.		
AY.11.1.1	Gamma Radiation Monitoring Subsystem	Inspect instrument cables where accessible. Inspect wiring where accessible. Inspect instrument tubing where accessible. Inspect instrument and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	
AY.11.1.1.1	Gamma Probe Well Structure		"Cover plate is not sealed and water accumulates in well from infiltration and condensation".
AY.11.1.1.2	Gamma Probe & Well Cable		"Coaxial cable is subject to failure from excessive moisture".
AY.11.1.1.3	Field Signal Cable		"Coaxial cable is subject to failure from excessive moisture".
AY.11.1.1.4	reserved		
AY.11.1.1.5	Count Rate Meters/ Alarm Comparators.		"Estimated age of equipment: 15 years". "Equipment is removed for shop calibration at 6 month intervals".
AY.14.3.1	Weight Factor & Loop Seal Instrumentation		"Age of equipment estimated at 20 years". "Calibration performed yearly at 1 hour per instrument". "Equipment requires frequent repairs.
AY.14.4	TANK LIQUID SURFACE LEVEL INSTRUMENTATION		
AY.14.4.1	FIC/Enraf Riser Extension		"AZ Enraf installed Good Condition". "AY FIC installed - Monthly maintenance".

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS			
REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AY.11	LEAK CONTROL SYSTEM		
AY.11.1	LEAK DET. PIT/SUMP INST.		
AY.11.1.1	Gamma Radiation Monitoring Subsystem	<p>Inspect instrument cables where accessible.</p> <p>Inspect wiring where accessible.</p> <p>Inspect instrument tubing where accessible.</p> <p>Inspect equipment and cabinets/terminal boxes for corrosion.</p> <p>Estimate age of equipment.</p> <p>Estimate maintenance repair frequency for equipment.</p> <p>Determine method of calibration and determine if equipment can be calibrated.</p> <p>Determine known continuous problems (operating or maintenance) with the equipment.</p> <p>Take photographs of equipment to illustrate problem areas.</p>	
AY.11.1.1.1	Gamma Probe Well Structure		"Cover plate is not sealed and water accumulates in well from infiltration and condensation".
AY.11.1.1.2	Gamma Probe & Well Cable		"Coaxial cable is subject to failure from excessive moisture".
AY.11.1.1.3	Field Signal Cable		"Coaxial cable is subject to failure from excessive moisture".
AY.11.1.1.4	reserved		
AY.11.1.1.5	Count Rate Meters/ Alarm Comparators.		"Estimated age of equipment: 15 years". "Equipment is removed for shop calibration at 6 month intervals".
AY.14.4.2	FIC/Enraf Level Sensor		"AY Enraf Good Condition". "AZ FIC estimated age 20 years".
AY.14.4.4	reserved		
AY.14.4.4	Signal Cables/Terminal Boxes		"FIC system: Estimated age 20 years". "Terminal boxes not adequately weather tight".
AY.14.4.5	Enraf/CASS Digital Interface		"CASS system: Estimated age 20 years".

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS			
REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AY.11	LEAK CONTROL SYSTEM		
AY.11.1	LEAK DET. PIT/SUMP INST.		
AY.11.1.1	Gamma Radiation Monitoring Subsystem	Inspect instrument cables where accessible. Inspect wiring where accessible. Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	
AY.11.1.1.1	<i>Gamma Probe Well Structure</i>		"Cover plate is not sealed and water accumulates in well from infiltration and condensation".
AY.11.1.1.2	<i>Gamma Probe & Well Cable</i>		"Coaxial cable is subject to failure from excessive moisture".
AY.11.1.1.3	<i>Field Signal Cable</i>		"Coaxial cable is subject to failure from excessive moisture".
AY.11.1.1.4	<i>reserved</i>		
AY.11.1.1.5	<i>Count Rate Meters/ Alarm Comparators.</i>		"Estimated age of equipment: 15 years". "Equipment is removed for shop calibration at 6 month intervals".
AY.14.5	SLUDGE WEIGHT (LEVEL) MONITORING	Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Failure rate 2-3 years". "Manual reading".
AY.15	TANK CONTENTS MIXING & HEATING SYSTEMS		

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS			
REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AY.11	LEAK CONTROL SYSTEM		
AY.11.1	LEAK DET. PIT/SUMP INST.		
AY.11.1.1	Gamma Radiation Monitoring Subsystem	<p>Inspect instrument cables where accessible. Inspect wiring where accessible. Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.</p>	
AY.11.1.1.1	Gamma Probe Well Structure		"Cover plate is not sealed and water accumulates in well from infiltration and condensation".
AY.11.1.1.2	Gamma Probe & Well Cable		"Coaxial cable is subject to failure from excessive moisture".
AY.11.1.1.3	Field Signal Cable		"Coaxial cable is subject to failure from excessive moisture".
AY.11.1.1.4	reserved		
AY.11.1.1.5	Count Rate Meters/ Alarm Comparators.		<p>"Estimated age of equipment: 15 years". "Equipment is removed for shop calibration at 6 month intervals".</p>
AY.15.1	AIR LIFT CIRCULATOR CONTROL SYSTEM	<p>Inspect wiring where accessible. Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.</p>	"Out of Service".
AY.15.1.1	Diff. Pressure Sensors		
AY.15.1.2	Local Indication		
AY.15.1.3	Flow Cutoff Valve		

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS			
REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AY.I1	LEAK CONTROL SYSTEM		
AY.I1.1	LEAK DET. PIT/SUMP INST.		
AY.I1.1.1	Gamma Radiation Monitoring Subsystem	Inspect instrument cables where accessible. Inspect wiring where accessible. Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	
AY.I1.1.1.1	Gamma Probe Well Structure		"Cover plate is not sealed and water accumulates in well from infiltration and condensation."
AY.I1.1.1.2	Gamma Probe & Well Cable		"Coaxial cable is subject to failure from excessive moisture."
AY.I1.1.1.3	Field Signal Cable		"Coaxial cable is subject to failure from excessive moisture."
AY.I1.1.1.4	reserved		
AY.I1.1.1.5	Count Rate Meters/ Alarm Comparators.		"Estimated age of equipment: 15 years." "Equipment is removed for shop calibration at 6 month intervals"
AY.I5.3	STEAM HEAT CONTROL / INSTRUMENTATION		"Not assessed"
AY.I6	SCC STATUS/MONITORING SYSTEM	Inspect instrument cables where accessible. Inspect wiring where accessible. Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	
AY.I6.1	AC POWER SUPPLY STATUS INST.		

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS			
REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AY.11	LEAK CONTROL SYSTEM		
AY.11.1	LEAK DET. PIT/SUMP INST.		
AY.11.1.1	Gamma Radiation Monitoring Subsystem	<p>Inspect instrument cables where accessible. Inspect wiring where accessible. Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.</p>	
AY.11.1.1.1	Gamma Probe Well Structure		"Cover plate is not sealed and water accumulates in well from infiltration and condensation"
AY.11.1.1.2	Gamma Probe & Well Cable		"Coaxial cable is subject to failure from excessive moisture"
AY.11.1.1.3	Field Signal Cable		"Coaxial cable is subject to failure from excessive moisture"
AY.11.1.1.4	reserved		
AY.11.1.1.5	Count Rate Meters/ Alarm Comparators		"Estimated age of equipment: 15 years" "Equipment is removed for shop calibration at 6 month intervals"
AY.16.2	AIR SUPPLY STATUS INST.		"No indicator of air quality"
AY.16.3	WATER SUPPLY STATUS INST.		"Local indication only"
AY.16.4	TANK CONCRETE STRUCTURE TEMPERATURE INST.	<p>Inspect instrument cables where accessible. Inspect wiring where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.</p>	

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS			
REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AY.II	LEAK CONTROL SYSTEM		
AY.II.1	LEAK DET. PIT/SUMP INST.		
AY.II.1.1	Gamma Radiation Monitoring Subsystem	<p>Inspect instrument cables where accessible.</p> <p>Inspect wiring where accessible.</p> <p>Inspect instrument tubing where accessible.</p> <p>Inspect equipment and cabinets/terminal boxes for corrosion.</p> <p>Estimate age of equipment.</p> <p>Determine maintenance repair frequency for equipment.</p> <p>Determine method of calibration and determine if equipment can be calibrated.</p> <p>Determine known continuous problems (operating or maintenance) with the equipment.</p> <p>Take photographs of equipment to illustrate problem areas.</p>	
AY.II.1.1.1	Gamma Probe Well Structure		"Cover plate is not sealed and water accumulates in well from infiltration and condensation".
AY.II.1.1.2	Gamma Probe & Well Cable		"Coaxial cable is subject to failure from excessive moisture".
AY.II.1.1.3	Field Signal Cable		"Coaxial cable is subject to failure from excessive moisture".
AY.II.1.1.4	reserved		
AY.II.1.1.5	Count Rate Meters/ Alarm Comparators.		"Estimated age of equipment: 15 years". "Equipment is removed for shop calibration at 6 month intervals".
AY.I6.4.1	Data Logger (See CASS Assessment)		"Out of Service".
AY.I6.4.2	Manual Readout Panel		
AY.I6.4.3	Signal Wiring/Terminal Boxes		
AY.I6.5	HEAT TRACE SYSTEM STATUS INST.		
AY.I6.6	CATHODIC PROTECTION SYSTEM STATUS INST.		

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS			
REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AY.11	LEAK CONTROL SYSTEM		
AY.11.1	LEAK DET. PIT/SUMP INST.		
AY.11.1.1	Gamma Radiation Monitoring Subsystem	Inspect instrument cables where accessible. Inspect wiring where accessible. Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	
AY.11.1.1.1	Gamma Probe Well Structure		"Cover plate is not sealed and water accumulates in well from infiltration and condensation".
AY.11.1.1.2	Gamma Probe & Well Cable		"Coaxial cable is subject to failure from excessive moisture".
AY.11.1.1.3	Field Signal Cable		"Coaxial cable is subject to failure from excessive moisture".
AY.11.1.1.4	reserved		
AY.11.1.1.5	Count Rate Meters/ Alarm Comparators.		"Estimated age of equipment: 15 years". "Equipment is removed for shop calibration at 6 month intervals".
AY.17	HEAT TRACE CONTROL SYSTEM	Inspect instrument cables where accessible. Inspect wiring where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	
AY.17.1	TEMPERATURE MONITORING SENSORS		"Estimated age of equipment 20 years".
AY.17.2	TEMP. CONTROLLER SUBSYSTEM		"Maintenance performed yearly at 1 hour per unit".

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS			
REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AY.11	LEAK CONTROL SYSTEM		
AY.11.1	LEAK DET. PIT/SUMP INST.		
AY.11.1.1	Gamma Radiation Monitoring Subsystem	<p>Inspect instrument cables where accessible.</p> <p>Inspect wiring where accessible.</p> <p>Inspect instrument tubing where accessible.</p> <p>Inspect equipment and cabinets/terminal boxes for corrosion.</p> <p>Estimate age of equipment.</p> <p>Estimate maintenance repair frequency for equipment.</p> <p>Determine method of calibration and determine if equipment can be calibrated.</p> <p>Determine known continuous problems (operating or maintenance) with the equipment.</p> <p>Take photographs of equipment to illustrate problem areas.</p>	
AY.11.1.1.1	Gamma Probe Well Structure		"Cover plate is not sealed and water accumulates in well from infiltration and condensation."
AY.11.1.1.2	Gamma Probe & Well Cable		"Coaxial cable is subject to failure from excessive moisture."
AY.11.1.1.3	Field Signal Cable		"Coaxial cable is subject to failure from excessive moisture."
AY.11.1.1.4	reserved		
AY.11.1.1.5	Count Rate Meters/ Alarm Comparators.		"Estimated age of equipment: 15 years." "Equipment is removed for shop calibration at 6 month intervals".
AY.17.3	OVER TEMP. CONTROLLER SUBSYSTEM		
AY.17.4	HEATER CONTACTOR - OTHER WIRING		
AY.17.5	PIPELINE HEAT TRACE TAPE HEATER		"Heat trace not maintained".

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS			
REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AY.11	LEAK CONTROL SYSTEM		
AY.11.1	LEAK DET. PIT/SUMP INST.		
AY.11.1.1	Gamma Radiation Monitoring Subsystem	<p>Inspect instrument cables where accessible.</p> <p>Inspect wiring where accessible.</p> <p>Inspect instrument tubing where accessible.</p> <p>Inspect equipment and cabinets/terminal boxes for corrosion.</p> <p>Estimate age of equipment.</p> <p>Determine maintenance repair frequency for equipment.</p> <p>Determine method of calibration and determine if equipment can be calibrated.</p> <p>Determine known continuous problems (operating or maintenance) with the equipment.</p> <p>Take photographs of equipment to illustrate problem areas.</p>	
AY.11.1.1.1	Gamma Probe Well Structure		"Cover plate is not sealed and water accumulates in well from infiltration and condensation".
AY.11.1.1.2	Gamma Probe & Well Cable		"Coaxial cable is subject to failure from excessive moisture".
AY.11.1.1.3	Field Signal Cable		"Coaxial cable is subject to failure from excessive moisture".
AY.11.1.1.4	reserved		
AY.11.1.1.5	Count Rate Meters/ Alarm Comparators.		"Estimated age of equipment: 15 years". "Equipment is removed for shop calibration at 6 month intervals".
AY.18	CATHODIC PROTECTION CONTROL SYSTEM	<p>Inspect instrument cables where accessible.</p> <p>Inspect wiring where accessible.</p> <p>Inspect equipment and cabinets/terminal boxes for corrosion.</p> <p>Estimate age of equipment.</p> <p>Determine maintenance repair frequency for equipment.</p> <p>Determine method of calibration and determine if equipment can be calibrated.</p> <p>Determine known continuous problems (operating or maintenance) with the equipment.</p> <p>Take photographs of equipment to illustrate problem areas.</p>	
AY.18.1	POWER CONTROLLER		"Estimated age less than 5 years".
AY.18.2	WIRING/CONDUIT/TBX		"Good Condition".

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6.7 CAIS Data Sheets

241 AY/AZ INSTRUMENTATION NARRATIVE

EQUIPMENT DESCRIPTION

Instrumentation for leak monitoring is located in the tank annulus, pump pit, annulus pump pit, the clean out boxes, and the waste transfer piping. This equipment monitors for leaks originating at each respective location. The leak detection pit monitoring equipment detects gamma radiation in effluent originating from a breach in the inner and outer shells. Radiation monitoring instruments are installed on the ventilation stacks of the annulus exhausts. Ventilation instruments monitor and alarm a loss of ventilation to the annulus, loss of blast heaters at the primary, and high or low tank pressure. Primary ventilation system is currently being upgraded by project W-030. Waste level is monitored and alarmed using FICs for AY farm and, which also includes a manual tape reel should the FIC fail.

SYSTEM CONDITION SUMMARY

REF NO 241AY.I1.1 LEAK DETECTION PIT/SUMP INSTRUMENTATION

Leak detection pit well structure allows water to accumulate in the pit causing frequent probe failures. The instrument air supply is not currently monitored for air quality and it is reported by maintenance that dirt and moisture in the instrument air causes problems. The weight factor and specific gravity system cabinet is in poor condition exhibiting poor door seals and climate control.

REF NO 241AY.I1.2 ANNULUS LEAK INSTRUMENTATION

The annulus radiation monitoring system is difficult to maintain due to the poor access to the CAMs. Most of the instrument cabinets and TBXs in the farm proper are in poor condition, allowing moisture and dirt to infiltrate the enclosures. The annulus liquid presence sensors (flake boxes) are currently out of service as is the CASS data logger. It is assumed that the on going construction efforts of project W-030 (primary ventilation systems upgrades) is the reasoning for these systems being out of service at this time.

Signal wire and terminations are in adequate condition, although the prints do not necessarily reflect the labeling in the field. The lack of print and labeling accuracy creates difficulty for the personnel to perform maintenance and repair actions. The pin recorders located in the instrument building (the same type of instruments used in the other DST farms) are difficult to maintain, fail frequently, and only provide manual collection of data for trending purposes.

REF NO 241AY.I2.1 TANK PRIMARY VENTILATION SYSTEM

Primary ventilation system was not inspected due to the on going construction efforts of project W-030 AY/AZ primary ventilation upgrade. Some observations and comments were made by the I & C technician that was interviewed concerning the existing primary ventilation system and include the following: Black poly tubing is used in some areas to supply instrument air. The pressure recorder is difficult to maintain and only provides for manual collection of data. Fan speed is adjusted manually by changing pulley diameter and the dampers are manually adjusted to obtain the required air flow.

REF NO 241AY.I2.2 TANK ANNULUS VENTILATION SYSTEM

The AY annulus exhaust system is currently out of service but planning is underway to replace the fans, HEPA housing, motor starter and control circuits, and local instrumentation (magnahelix gauges and tubing) with in-kind equipment using maintenance forces.

REF NO 241AY.I4 TANK CONTENTS MONITORING SYSTEM

Maintenance has reported numerous thermocouple probe failures. Weight factor sample probes become plugged frequently, requiring maintenance to flush out the tubing. Poor quality instrument air also creates problems with this system. AY farm is currently using the FIC gauges to monitor tank waste level. The FIC's require frequent repair action because of sensor failure.

AY farm is currently in disarray due to the construction efforts for project W-030. During the time of the field inspection instrument air was valved off and all the pneumatic operated systems were not functioning.

The overall condition of AY farms instrumentation is "fair" 5.

CONDITION ASSESSMENT INFORMATION SYSTEM

Report : RELATED SITE EQUIPMENT
Filename : RPTEQPT.lis
Run by : CAIS
Report Date : 29-NOV-95
Parameters Entered
Parent Equipment ID: %

CAIS Special Report - RPT-005

Asset	Site Component	Name	Sys No.	System Name

241AY-0000	: UNDRGRD WASTE STOR TANK FARM			
241AY RE-101 & 102-1-WELL		GAMMA PROBE WELL STRUCTURE	1.1.1.1	Gamma Probe Well Structure
241AY RE-101 & 102-1-WELL		GAMMA PROBE WELL STRUCTURE	1.1.1.1	Gamma Probe Well Structure
COVER PLATE IS NOT SEALED & WATER ACCUMULATES IN WELL FROM INFILTRATION & CONDENSATION.				
241AY CHEM COMPOSITION MON		CHEMICAL COMPOSITION MONITORING		
241AY WF & LOOP SEAL INSTRUMENT			4.3.1	SPECIFIC GRAVITY INSTRUMENTATION
EST EQUIPMENT AGE = 20YRS. ANNUAL CALIBRATION @ 1 HOUR/INSTRUMENT.				
241AY DAMPER CONTROL				
241AY DAMPER CONTROL SURVEY			2.1.6	Damper Control Subsystem
DAMPERS ADJUSTED MANUALLY.				
6.7-5				

241AY FAN MOTOR CONTROL	FAN MOTOR CONTROL SUBSYS	
241AY FAN MOTOR CONTROL SURV	2.1.5	Fan-Motor Control Subsystem
FAN SPEED ADJUSTED MANUALLY.		
241AY HIGH LEVEL ALARM	TK WASTE HIGH LEVEL ALARM	
241AY LLE-101 & 102-1	WASTE LIQUID HIGH LEVEL PROBE	1.7.1 WASTE HIGH LEVEL PROBE
NO MAINTENANCE BEING PERFORMED.		
241AY ALARM PANELS	TK FARM ALARM PANELS	1.7.2 TANK FARM ALARM PANELS
GOOD CONDITION.		
241AY WIRING/CONDUIT/TBX	SIGNAL WIRING/ETC	1.7.3 H/L ALARM SIGNAL WIRE/COND/TBX

CAIS Special Report - RPT-005

Asset	Site Component	Survey Component	Survey Comment	Name	Sys No.	System Name
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241AY-0000 : UNDRGRD WASTE STOR TANK FARM

241AY LDE-101 & 102-24 ANN PUMP PIT LDE

241AY LDE-101 & 102-24 SURVEY ANN PUMP PIT LDE SURV 1.2.3 ANNULUS PUMP PIT LDE

CONTINUITY PROBE. MONTHLY FUNCTIONAL CHECK @ 1/2 HOUR/INSTRUMENT.

241AY SLE-101 & 102- 1 TO 10 SLUDGE WEIGHT MONITORING

SLE-101/102- 1 TO 10 SURV

4.5 SLUDGE WEIGHT (LEVEL) MONITORING

241AY TK ANN VENTILATION SYS

241AY K1 & K2-DPI1-1 TO 4 ANNULUS DIFFERENTIAL PRESSURE 2.2.1 Annulus Pressure System

EST EQUIPMENT AGE = 20YRS. GAUGES ARE RE
PLACED FREQUENTLY (2-3 YRS). ANNUAL FIEL
D CALIBRATION @ 30 MINUTES/INSTRUMENT.

241AY TK LLI	TK LIQ SURFACE LEVEL INSTRUMENT		
241AY LLI-101 & 102	FIC/ENRAF RISER EXTENSION	4.4.1	Enraf Riser Extension
AY FIC INSTALLED - MONTHLY MAINTENANCE.			
241AY LLE-101 & 102	FIC/ENRAF LEVEL SENSOR	4.4.2	Enraf Level Sensor
AY FIC EST AGE = 20YRS.			
241AY SIGNAL CABLES/TBX		4.4.4	Terminal Boxes
EST AGE = 20YRS. TERMINAL BOXES NOT ADEQUATELY WEATHER-TIGHT.			
241AY TK DP INSTRUMENTATION	DIFFERENTIAL PRESSURE INSTRUMENT		
241AY I/A TUBING	FIELD I/A TUBING	2.1.1.3	Field Instrument Air Tubing
BLACK POLY TUBING NOT CONDUCTIVE TO PROPER MAINTENANCE.			

29-NOV-95

CONDITION ASSESSMENT INFORMATION SYSTEM

Page 3 of 6

CAIS Special Report - RPT-005

Asset

Site Component

Survey Component

Survey Comment

Name

Sys No.

System Name

241AY-0000 : UNDERGRD WASTE STOR TANK FARM

241AY PS-TK-101 & 102-AY

PRESSURE SWITCH/ALARM

2.1.1.4 Pressure Switch/Alarm

EST EQUIPMENT AGE = 20YRS. LOW REPAIR RATE. ANNUAL FIELD CALIBRATION @ 1HR/INSTRUMENT.

241AY PR/PR/FR-101 & 102

PRESSURE RECORDER

2.1.1.5 2-Pen Pressure Recorders (241-SY-271)

EST EQUIPMENT AGE = 20YRS. REQUIRES FREQUENT MAINTENANCE.

241AY XFER LINE CONTROL

TRANSFER LINE CONTROL SYSTEM

241AY VLV POS INDIC/INSTRUMENT VLV POSITION IND/INST 3.2 VALVE POSITION INSTRUMENTATION/INDICATI

MAINTENANCE NOT PERFORMED ON THIS EQUIPMENT.

241AY VALVE CONTROL SYSTEM

3.3 VALVE CONTROL SYSTEM (DOV in flush Pit)

VALVES ARE MANUALLY OPERATED.

241AY SERVICE PIT INSTRUMENTAT 3.5 WASTE FLOW MONITORING INSTRUMENTATION (S
EST EQUIPMENT AGE = 15YRS.

241AY FLOW MONITOR & TOTALIZER 3.5.1.1 FLOW MONITOR & TOTALIZER

NO KNOWN PROBLEMS.

241AY RADIATION MONITOR GAMMA RADIATION MONITOR 3.5.1.2 GAMMA RADIATION MONITOR

NO KNOWN PROBLEMS.

241AY801 MCC-AX-100 PUMP CONTROL SUBSYSTEM 3.1 PUMP CONTROL SUBSYSTEM

EST EQUIP AGE = 20YRS.

241AY TEMP/VAPOR INSTRUMENTS

241AY TE-101 & 102-PROBES THERMOCOUPLE PROBES 4.1.1 Thermocouple Probes

EST EQUIPMENT AGE = 20YRS. NUMEROUS T/C
PROBES HAVE FAILED.

CONDITION ASSESSMENT INFORMATION SYSTEM

Site Component	Name	Sys No.	System Name
Survey Component	Survey Comment		

6.2 AIR SUPPLY STATUS INST.

PLY STATUS INST

GAMMA RAD MONITORING SYSTEM

1.1.1.1.1 Gamma Probe Well Structure

1.1.1.2 Gamma Probe & Well Cable

1.1.1.3 Field Signal Cable

COAXIAL CABLE IS SUBJECT TO FAILURE FROM
EXCESSIVE MOISTURE.

241AY CRM-101 & 102-1 COUNT RATE METERS/ALARM COMPAR 1.1.1.5 Log Alarm Count Rate Meters/ Alarm
compa

EST EQUIP AGE = 15 YRS. EQUIPMENT REMOVE
D FOR SHOP CALIBRATION @ 6 MONTH INTERVA
LS.

241AY801-0000 : TANK FARM INSTRUMENT HOUSE

241AY ANN CAM RM ANN CAM RM MONITORING SUBSYSTE

241AY EXH-K2-TUBING AIR SAMPLER PROBE/TUBING/ETC 1.2.1.1 Air Sampler Probe/ Tubing/ etc

STAINLESS STEEL TUBING IS IN GOOD CONDIT
ION.

241AY K2-CAM-101 & 102-AY RADIATION ANALYZER 1.2.1.2 Radiation Analyzer

EST EQUIPMENT AGE = 15 YRS. LOW REPAIR R
ATE. ANNUAL SHOP CALIBRATION @ 8HRS/INST
RUMENT. CAM UNIT > 100# & IS MANUALLY MO
VED TO TRANSPORT TO THE SHOP FOR CALIBRA
TION.

CAIS Special Report - RPT-005

Asset	Site Component	Name	Sys No.	System Name

241AY801-0000 : TANK FARM INSTRUMENT HOUSE				
241AY EXH-K2-CAB				
CABINETS			1.2.1.3	Cabinets (at each tank)
DOORS DO NOT FIT PROPERLY ALLOWING DUST INFILTRATION. POOR CLIMATE CONTROL - HOT IN SUMMER, COLD IN WINTER.				
241AY WIRING/CONDUIT			SIGNAL WIRING/CONDUIT	1.2.1.5 Signal Wiring/ Conduit
SIGNAL WIRING IS IN GOOD CONDITION BUT IS NOT WELL MARKED OR DOCUMENTED FOR TRACING.				
241AY801A RR-101/102-AY			RECORDERS AND ALARMS	1.2.1.4 1-Pen recorder & Alarms(SY-271 & 242-S)
EST EQUIPMENT AGE = 15 YRS. ALARMS ARE RELAYED OFF OF FIELD SENSOR. HIGH MAINTENANCE REQUIRED TO KEEP RECORDERS SERVICEABLE.				
241AY LK DET PIT/SUMP INST			LEAK DETECTION PIT/SUMP INST.	
241AY WFT & SGT 101 & 102-1				
WF & SPG MONITORING SUBSYSTEM			1.1.2	Weight Factor & Specific Gravity Monitor

THE INSTRUMENT AIR SUPPLY PROVIDES WET,
DIRTY AIR.

241AY PT 101 TO 102 A&B LK DET PIT SAMPLE TUBES 1.1.2.1 Sample Tubes (Leak Det. Pits)

GOOD CONDITION.

241AY PT-1-1 TO 102 A&B WF & SPG PRESSURE SENSORS 1.1.2.2 Weight Factor & Specific Gravity Pressur

EST EQUIPMENT AGE = 15 YRS. APPEAR TO BE
IN GOOD CONDITION.

241AY 101 & 102-CAB WEIGHT FACTOR CABINET 1.1.2.3 Weight Factor Cabinet (Xmitter Enclosure

CABINET DOORS DO NOT SEAL PROPERLY ALLOW
ING DIRT TO INFILTRATE CABINET. CLIMATE
CONTROL NOT VERY EFFECTIVE;RESISTANCE HE
ATERS DON'T WORK SOMETIMES IN WINTER, NO
COOLING PROVISION IN SUMMER.

241AY FIELD TUBING FIELD TUBING 1.1.2.4 Field Tubing

CONDITION ASSESSMENT INFORMATION SYSTEM

29-NOV-95

CAIS Special Report - RPT-005

Asset	Site Component	Name	Sys No.	System Name
Survey Comment				

241AY801-0000 : TANK FARM INSTRUMENT HOUSE

TUBING IS ROUTED INSIDE A BURIED TUBING SHEATH FROM REMOTE CABINETS TO THE 801 BUILDING. TUBING APPEARS TO BE IN GOOD CONDITION BUT HAS BEEN FILLED WITH WATER & DEBRIS FROM CONDENSATION INHERENT TO THE INSTRUMENT AIR SYSTEM.

241AY801 WFAS-101 &102-1 WF/SPG PS&PI - INST PNL & RACK 1.1.2.5 W.F. & SpG Pressure Switches & Indicator

EST EQUIPMENT AGE = 15 YRS. LOW REPAIR RATE. ANNUAL FIELD CALIBRATION @ 1HR/INSTRUMENT. NO RECURRENT PROBLEMS. EQUIPMENT DIFFICULT TO ACCESS.

241AY LOCAL ALARM PANELS	ALARM ANNUNCIATOR PANELS	
241A271 ALARM PANEL	LOCAL ALARM PANEL	1.5.1 Alarm Panel in 241-SY-271
GOOD CONDITION. EST EQUIPMENT AGE = 20YR		
241AY801 LOCAL ALARM PANEL		1.5.2 Local Tank Farm Alarm Panel

WHC-SD-W314-ES-018, Rev 0

GOOD CONDITION.

6.8 Other Reports

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6.9 CAMP Work Sheets

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WHC-SD-W314-ES-018, Rev 0

CAMP RATING FORM

Project Title: AY T.F.: Leak Control System: Leak Det. Pit: Gamma Rad. Mon. Subsystem

B&R Code: _____ Rev #: 0 FY: 1996

Project Id #: AY.I1.1.1 FUDS: _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.		30		30
Technological Base (R&D)		30		30
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics				
Criticality				
Infrastructure				40
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				30
Mission Capability, Capacity, & Quality				40
Asset Condition				55
National Business Strategies/Partnerships				
Highest of Each Subcategory	20	30	20	55

PROJECT RATING: **56**

Final Project Rating **56**

Note: 20 is a Default Rating

C.D. Acree	376-1901	9/22/95
Rated By	Ext	Date Rated

Reviewed By	Ext	Date Reviewed
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Applicable Regulations or Policies

ER/WM, Compliance, 30: Minimum detection capability lacking
M&I, Asset Condition, 55: Aging System, Spare Parts availability concern.
M&I, Infrastructure, 40: Substandard Operation

Additional Information & Affected Projects

M&I, Mission Capability, 40: System not designed to operate in a wet environment.

Shaded Areas Are Not For Use

WHC-SD-W314-ES-018, Rev 0

CAMP RATING FORM

Project Title: AY Tank Farm/Leak Control System/Leak Detection System Pit WF&SpG Monitor

B&R Code: _____ **Rev #:** 0 **FY:** 1996

Project Id #: AY.J1.1.2 **FUDS:** _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.				
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics				
Criticality				
Infrastructure				40
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				50
Asset Condition				50
National Business Strategies/Partnerships				
Highest of Each Subcategory	20	20	20	50

PROJECT RATING:	50
Final Project Rating	50

Note: 20 is a Default Rating

<u>C. D. Acree</u>		<u>9/22/95</u>
Rated By	Ext	Date Rated

Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

M&I, Asset Cond., 50: Foxboro equipment is obsolete , spare parts may not be available.
M&I, Capability, 50: Does not measure liquid level directly, uses pressure.
M&I, Infrastructure, 40: System is a continuous user of instrument air.

Additional Information & Affected Projects

Shaded Areas Are Not For Use

WHC-SD-W314-ES-018, Rev 0

CAMP RATING FORM

Project Title: AY Tank Farm Annulus Leak Instrumentation/ CAM Rad. monitoring System

B&R Code: _____ Rev #: 0 FY: 1996

Project Id #: AY.I1.2.1 FUDS: _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.				
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety	35			
Fire Protection				
Health Physics	40			
Criticality				
Infrastructure				40
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				40
Asset Condition				35
National Business Strategies/Partnerships				
Highest of Each Subcategory	40	20	20	40

PROJECT RATING:	43
Final Project Rating	43

Note: 20 is a Default Rating

C. D. Acree		9/22/95
Rated By	Ext	Date Rated

Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

H&S, Health Physics, 40: Potential for personnel radiation exposure.
H&S, Industrial Safety, 35: Potential for personnel injury lifting CAM unit (100lbs)

Additional Information & Affected Projects

M&I, Asset Condition, 40: Aging System, subject to false alarms
M&I, Mission Capability, 35: Aging system, not latest recommend site standard, false alarms, radon interf
M&I, Infrastructure, 40: Aging System, subject to false alarms & is difficult to lift.

Shaded Areas Are Not For Use

WHC-SD-W314-ES-018, Rev 0

CAMP RATING FORM

Project Title: AY Tank Farm Annulus Leak Inst./Liquid Presence Multiple Sensor Probe

B&R Code: _____ Rev #: 0 FY: 1996

Project Id #: AY.I1.2.2 FUDS: _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.		40		
Technological Base (R&D)				30
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics				
Criticality				
Infrastructure				40
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				55
Asset Condition				50
National Business Strategies/Partnerships				
Highest of Each Subcategory	20	40	20	55

PROJECT RATING:	57
Final Project Rating	57

Note: 20 is a Default Rating

C. D. Acree		9/22/95
Rated By	Ext	Date Rated

Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

M&I, Asset Condition, 50: Deteriorated, UV damaged, elec. insulation.
M&I, Mission Capability, 55: Poor leak detect., manual operation, cannot calibrate, cannot verify Operabili
ER/WM, Compliance, 40: Fails to detect some leaks, subject to operator interpretation

Additional Information & Affected Projects

M&I, Infrastructure, 40: Aging System, large consumer of instrument air.
M&I, Tech Base, 30: Not a standard industrial design, expensive to fabricate.

Shaded Areas Are Not For Use

WHC-SD-W314-ES-018, Rev 0
CAMP RATING FORM

Project Title: AY Tank Farm/Pipeline Leak Inst./PitLiquid Leak Detect. Sub. Sys./COB, Transfer

B&R Code: _____ Rev #: 0 FY: 1996

Project Id #: AY.I1.3.1, SY.I1.3.3, SY.I1.1.3, SY.I1.2.3 FUDS: _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.		50		
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety	35			
Fire Protection				
Health Physics	50			
Criticality				
Infrastructure				50
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				50
Asset Condition				55
National Business Strategies/Partnerships				
Highest of Each Subcategory	50	50	20	55

PROJECT RATING:	60
Final Project Rating	60

Note: 20 is a Default Rating

C. D. Acree		9/22/95
Rated By	Ext	Date Rated

Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

H&S, Health Physics, 50: Potential for maintenance personnel radiation exposure.
H&S, Industrial Safety, 35: Potential for personnel injury working in pits.
ER/WM, Compliance, 50: Cannot detect small leaks or detect secondary containment failure.

Additional Information & Affected Projects

M&I, Asset Condition, 55: Aging System, subject to false alarms
M&I, Mission Capability, 50: System can not detect "small" leaks, can not detect secondary containment failure, cannot calibrate system, cannot verify system operability.
M&I, Infrastructure, 50: Not compliant with NEC, wiring insulation unsafe, wiring life expectancy is short.

Shaded Areas Are Not For Use

WHC-SD-W314-ES-018, Rev 0

CAMP RATING FORM

Project Title: AY Tank Farm/Pipeline Leak Inst./Pipeline Annulus Pressure Sensor

B&R Code: _____ **Rev #:** 0 **FY:** 1996

Project Id #: AY.I1.3.2 **FUDS:** _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.		50		
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety	35			
Fire Protection				
Health Physics	50			
Criticality				
Infrastructure				40
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				50
Asset Condition				40
National Business Strategies/Partnerships				
Highest of Each Subcategory	50	50	20	50

PROJECT RATING: 56
Final Project Rating 56
 Note: 20 is a Default Rating

Rated By C. D. Acree **Ext** 9/29/95
Date Rated

Reviewed By _____ **Ext** _____
Date Reviewed

Applicable Regulations or Policies

ER/WM, Compliance, 50: Pipelines do not have Inst. that can detect pl secondary containment failure.
 M&I, Mission Capability, 50: System sensitivity is unknown, it cannot be calibrated, is difficult to verify operability, not available on all pipelines.

Additional Information & Affected Projects

H&S, Health Physics, 50: Potential for maintenance personnel radiation exposure.
 M&I, Asset Condition, 40: Aging system, suspected corroded valves may inhibit system functionality.
 M&I, Infrastructure, 40: System is continual user of instrument air.

(See AY.I1.3.1)

Shaded Areas Are Not For Use

WHC-SD-W314-ES-018, Rev 0 **CAMP RATING FORM**

Project Title: AY Tank Farm Pump Permissive (Master Pump Shutdown)

B&R Code: _____ **Rev #:** 0 **FY:** 1996

Project Id #: AY.I1.4 **FUDS:** _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.				
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics				
Criticality				
Infrastructure				45
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				55
Asset Condition				55
National Business Strategies/Partnerships				
Highest of Each Subcategory	20	20	20	55

PROJECT RATING:	55
Final Project Rating	55

Note: 20 is a Default Rating

<u>C. D. Acree</u>		<u>9/22/95</u>
Rated By	Ext	Date Rated
Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

M&I, Mission Capability, 55: Mission adversely impacted by false alarms, any alarm in all tank farms can shut down a transfer, even in farms that are unrelated.

M&I, Asset Condition, 55: Really the same as the Leak Detection system.

M&I, Infrastructure, 45: Spurious shutdowns cause delays and idle lots of people.

Additional Information & Affected Projects

M&I, Mission Capability, 55: System provides no operational versatiltiy. cannot easily make simultaneous transfers. Cannot easily isolate operations in different facilities.

Shaded Areas Are Not For Use

WHC-SD-W314-ES-018, Rev 0 **CAMP RATING FORM**

Project Title: AY Tank Farm Remote Alarm Signaling System (Gamewell Loop Sys.)

B&R Code: _____ Rev #: 0 FY: 1996

Project Id #: AY.I1.6 FUDS: _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.				
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics				
Criticality				
Infrastructure				40
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				35
Asset Condition				50
National Business Strategies/Partnerships				
Highest of Each Subcategory	20	20	20	50

PROJECT RATING:	50
Final Project Rating	50

Note: 20 is a Default Rating

C. D. Acree		9/22/95
Rated By	Ext	Date Rated

Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

M&I, Infrastructure, 40: Poor interface design, not standard hardware, spare parts problem.
M&I, Mission Capability, 35: System does not provide unique alarm identification.

M&I, Asset Condition, 50: System in poor condition, maintenance intensive, mostly doesn't work.

Additional Information & Affected Projects

WHC-SD-W314-ES-018, Rev 0 **CAMP RATING FORM**

Project Title: AY Tank Farm Tank Waste High Level Alarm Subsystem

B&R Code: _____ **Rev #:** 0 **FY:** 1996

Project Id #: AY.11.7 **FUDS:** _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.				
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics	45			
Criticality				
Infrastructure				40
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				55
Asset Condition				55
National Business Strategies/Partnerships				
Highest of Each Subcategory	45	20	20	55

PROJECT RATING:	57
Final Project Rating	57

Note: 20 is a Default Rating

<u>C. D. Acree</u>		<u>9/18/95</u>
Rated By	Ext	Date Rated
Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

M&I, Asset Condition, 55: Aging system, equipment similar to Leak Detection System.
M&I, Mission Capability, 55: System is not intrinsically safe, not suitable for flammable gas environment

Additional Information & Affected Projects

H&S, Health Physics, 45: Probe maintenance will expose workers to radiation.
M&I, Infrastructure, 40: Maintenance of probe is difficult.

WHC-SD-W314-ES-018, Rev 0

CAMP RATING FORM

Project Title: AY DST DIFFERENTIAL PRESSURE INSTR. SUBSYSTEM

B&R Code: _____ Rev #: 0 FY: 1996

Project Id #: AY.I2.1.1 FUDS: _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.				
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics				
Criticality				
Infrastructure				40
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				50
Asset Condition				40
National Business Strategies/Partnerships				
Highest of Each Subcategory	20	20	20	50

PROJECT RATING:	50
Final Project Rating	50

Note: 20 is a Default Rating

C. D. Acree		9/22/95
Rated By	Ext	Date Rated

Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

M&I, Asset Condition, 40: Equipment is obsolete (50 yr old design), spare parts availability concern.
M&I, Capability, 50: Recorders are significant maintenance effort. Pressure data is not automatically sent to electronic database.

Additional Information & Affected Projects

M&I, Asset Condition, 40: Some tubing deterioration concerns.
M&I, Infrastructure, 40: Continuous user of instrument air.

Shaded Areas Are Not For Use

WHC-SD-W314-ES-018, Rev 0

CAMP RATING FORM

Project Title: AY Tank Farm/Waste Flow Monitoring Inst./Service Pit Inst.

B&R Code: _____ Rev #: 0 FY: 1996

Project Id #: AY.13.5.1 FUDS: _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.				
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics				
Criticality				
Infrastructure				
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				45
Asset Condition				40
National Business Strategies/Partnerships				
Highest of Each Subcategory	20	20	20	45

PROJECT RATING:	45
Final Project Rating	45

Note: 20 is a Default Rating

C. D. Acree		9/18/95
Rated By	Ext	Date Rated
Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

M&I, Capability, 45: Flow meter cannot measure low flows.
M&I, Asset Condition, 40: Aging system,

Additional Information & Affected Projects

WHC-SD-W314-ES-018, Rev 0

CAMP RATING FORM

Project Title: AY DST WASTE; THERMOCOUPLE TREES, (SY-102 & SY-103)

B&R Code: _____ Rev #: _____ FY: _____

Project Id #: AY.14.1 FUDS: _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.				
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics	40			
Criticality				
Infrastructure				40
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				40
Asset Condition				35
National Business Strategies/Partnerships				
Highest of Each Subcategory	40	20	20	40

PROJECT RATING: **43**

Final Project Rating **43**

Note: 20 is a Default Rating

C. D. Acree		9/22/95
Rated By	Ext	Date Rated

Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

M&I, Capability, 40: Elements can not be calibrated. Elements spaced at 2 ft intervals limit capability. Iron lead is subject to corrosion. Note: Probe may not withstand mixer pump forces.
H&S, Health Physics, 40: Probe maintenance will expose workers to radiation.

Additional Information & Affected Projects

M&I, Infrastructure, 40: Elements are not replaceable, probe is not maintainable.
M&I, Asset Condition, 35: Equipment is old, but functional

Equipment is 19 years old, life expectancy is a few more years.

Shaded Areas Are Not For Use

WHC-SD-W314-ES-018, Rev 0

CAMP RATING FORM

Project Title: AY DST WASTE; FIC LIQUID SURFACE LEVEL INST. SUBSYSTEM

B&R Code: _____ Rev #: _____ FY: _____

Project Id #: AY.I4.4 FUDS: _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.				
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics	35			
Criticality				
Infrastructure				50
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				60
Asset Condition				60
National Business Strategies/Partnerships				
Highest of Each Subcategory	35	20	20	60

PROJECT RATING:	61
Final Project Rating	61

Note: 20 is a Default Rating

C. D. Acree		9/29/95
Rated By	Ext	Date Rated

Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

M&I, Asset Condition, 60: FIC gauges are inoperative. Extensive maintenance is normally required.
M&I, Capability, 60: FIC Gauges have poor resolution.
M&I, Infrastructure, 50: Poor resolution of FIC gauges exacerbates mass balance computation
for checking waste transfer operations.

Additional Information & Affected Projects

H&S, Health Physics, 35: Maintenance of the FIC may expose workers to radiation.
M&I, Infrastructure, 50: Future spare parts problem.

Shaded Areas Are Not For Use

WHC-SD-W314-ES-018, Rev 0 **CAMP RATING FORM**

Project Title: AY Tank Farm/Pipeline Heat Trace I&C Subsystem

B&R Code: _____ **Rev #:** 0 **FY:** 1996

Project Id #: AY.17 **FUDS:** _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.				
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics				
Criticality				
Infrastructure				40
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				40
Asset Condition				50
National Business Strategies/Partnerships				
Highest of Each Subcategory	20	20	20	50

PROJECT RATING:	50
Final Project Rating	50

Note: 20 is a Default Rating

<u>C. D. Acree</u>		<u>9/29/95</u>
Rated By	Ext	Date Rated

Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

M&I, Asset Condition, 50: Some Pipelines have broken heat trace heaters.
M&I, Capability, 40:
M&I, Infrastructure, 40: Lack of pipe heating may affect transfer capability on some pipelines.

Additional Information & Affected Projects

7.0 AZ TANK FARM

7.1 PDRD Cross Reference Tables

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PROJECT W-314 PDRD CROSS REFERENCE TABLE Instrument & Control Systems				
PDRD FUNCTION ID#	PDRD FUNCTION VERB	PDRD DATA VARIABLE	EQUIPMENT REFERENCE TREE	COMMENTS
3.2.1.1.1.1	Monitor	Hydroxide conc. Nitrate concentration Nitrite concentration Sodium concentration Specific Gravity	Non-existent architecture Non-existent architecture Non-existent architecture Non-existent architecture AZ.14.3.1	Manual Sampling, Lab. Analysis function A Trade Study should reassess the need for this architecture.
3.2.1.1.1.1.2	Compare	Hydroxide conc. Nitrate concentration Nitrite concentration	Non-existent architecture Non-existent architecture Non-existent architecture	Lab. Analysis function
3.2.1.1.1.2.1.2	Compare	Specific Gravity	Not Assessed	Weight Factor Monitoring is just monitoring.
3.2.1.1.1.2.1.3	Compare	Sodium concentration	Non-existent architecture	Lab. Analysis function
3.2.1.1.1.2.1.4	Compare	Pu concentration	Non-existent architecture	Lab. Analysis function
3.2.1.1.1.3	Alarm	Waste composition	Non-existent architecture	Administrative function
3.2.1.1.1.4	Control	Waste composition	Non-existent architecture	Administrative function
3.2.1.1.1.5	Monitor	Supernate Liquid Level	AZ.14.4.2	Old FIC gauges are being replaced with Enraf gauges
			AZ.11.7	Old high level probes, field wiring and relays require replacement.
3.2.1.1.1.6	Compare	Supernate Liquid Level	Not Assessed	Old CASS computer function
			AZ.11.4	Old relays work in Master Pump Shutdown (re: AZ.11.4)
3.2.1.1.1.7	Alarm	Supernate Liquid Level	Not Assessed	Old CASS computer function
			AZ.11.5	Local Alarm function (re: AZ.11.5)
3.2.1.1.1.8	Control	Supernate Liquid Level	Not Assessed AZ.13.1	Administrative function, manual pump control.
3.2.1.1.1.9	Monitor	Waste Temperature	AZ.14.1	Old Manual Operation

PROJECT W-314 PDRD CROSS REFERENCE TABLE Instrument & Control Systems				
PDRD FUNCTION ID#	PDRD FUNCTION VERB	PDRD DATA VARIABLE	EQUIPMENT REFERENCE TREE	COMMENTS
3.2.1.1.1.10	Compare	Waste Temperature	Not Assessed	Old Manual Input to CASS
3.2.1.1.1.11	Alarm	Waste Temperature	Not Assessed	Old Output Report from CASS
3.2.1.1.1.12 3.2.1.2.1.1	Control	Waste Temperature (indirectly) Ventilation System Airflow	Not Assessed re: AZ.I2.1.5	Administrative function Project W-030 will improve. Manual adjustment required
3.2.1.1.1.13	Monitor	Waste Level	AZ.I4.4.2	Enrafs are replacing the old FIC. See part 3.2.1.1.1.5
3.2.1.1.1.14	Compare	Waste Level	Not Assessed	See 3.2.1.1.1.6
3.2.1.1.1.15	Alarm	Waste Level	Not Assessed	See 3.2.1.1.1.7
3.2.1.1.1.16	Control	Waste Level	No automatic control architecture re: AZ.I3.1	Administrative function
3.2.1.1.1.17(1)	Monitor	Leak Det. Pit Radiation Level	AZ.I1.1.1	
3.2.1.1.1.17(1)	Monitor	Leak Det. Pit Temperature	AZ.I1.1.4, Not Assessed	* Trade Study should reassess the need for this instrument. Suggest deletion and revised PDRD.
3.2.1.1.1.17(1)	Monitor	Leak Det. Pit Waste Level	AZ.I1.1.2	
3.2.1.1.1.17(2)	Monitor	Tank Annulus Radiation Level	AZ.I1.2.1	
3.2.1.1.1.17(2)	Monitor	Tank Annulus Liquid Presence/Level	AZ.I1.2.2	
3.2.1.1.1.18	Compare	Leak Det. Pit Radiation Level	AZ.I1.1.1.5	
3.2.1.1.1.18	Compare	Leak Det. Pit Temperature	Not Assessed	* Trade Study should reassess the need for this instrument. Suggest deletion and revised PDRD.
3.2.1.1.1.18	Compare	Leak Det. Pit Water Level	AZ.I1.1.2.5	

PROJECT W-314 PDRD CROSS REFERENCE TABLE Instrument & Control Systems				
PDRD FUNCTION ID#	PDRD FUNCTION VERB	PDRD DATA VARIABLE	EQUIPMENT REFERENCE TREE	COMMENTS
3.2.1.1.1.18	Compare	Tank Annulus Radiation Level	AZ.I1.2.1.4	
3.2.1.1.1.18	Compare	Tank Annulus Liquid Presence/Level	AZ.I1.2.2	
3.2.1.1.1.19	Alarm	Leakage From Tank Bottom	AZ.I1.2.1.4	
3.2.1.1.1.19	Alarm	Leakage From Tank Annulus	AZ.I1.1.2.5 AZ.I1.1.1.5	
3.2.1.1.1.20	Control	Leakage From Tank Bottom	Not Assessed	Administrative function
3.2.1.1.1.20	Control	Leakage From Tank Annulus Bottom	Not Assessed re: AZ.I3.1 & L.D.P. pump	Administrative function
3.2.1.1.1.21	Monitor	Leak Det. Pit Liquid Level	See 3.2.1.1.1.17(.1)	
3.2.1.1.1.22	Compare	Leak Det. Pit Liquid Level	See 3.2.1.1.1.18	
3.2.1.1.1.23	Alarm	Leak Det. Pit Liquid Level	See 3.2.1.1.1	
3.2.1.1.1.24	Control	Leak Det. Pit Liquid Level	AZ.I1.1.2.5	
3.2.1.1.1.25	Monitor	Tank Vapor Space Temperature Gradient	AZ.I4.1	Old CASS Data Loggers. Old manual operation
3.2.1.1.1.26	Compare	Tank Vapor Space Temperature Gradient	Not Assessed	Old CASS operation
3.2.1.1.1.27	Alarm	Tank Vapor Space Temperature Gradient	Not Assessed	Old CASS operation

PROJECT W-314 PDRD CROSS REFERENCE TABLE Instrument & Control Systems				
PDRD FUNCTION ID #	PDRD FUNCTION VERB	PDRD DATA VARIABLE	EQUIPMENT REFERENCE TREE	COMMENTS
2.1.1.1.1.28	Control	Tank Vapor Space Temperature Gradient	Not Assessed re: AZ.I2.1.5	Administrative function Project W-030 will improve.
3.2.1.1.1.29	Monitor	Tank (Concrete) Structure Temperature	AZ.I6.4	Old Data Logger connects to CASS
3.2.1.1.1.30	Compare	Tank (Concrete) Structure Temperature	Not Assessed	Old CASS operation
3.2.1.1.1.31	Alarm	Tank (Concrete) Structure Temperature	Not Assessed	Old CASS operation
3.2.1.1.1.32 3.2.1.2.1.1.2	Control	Tank (Concrete) Structure Temperature (indirectly) Ventilation System Airflow	Not Assessed re: AZ.I2.1.5	Administrative function Project W-030 will improve.
3.2.1.1.1.33	Monitor	Tank Vapor Space Pressure	AZ.I2.1.1.2 AZ.I2.1.1.5	
3.2.1.1.1.34	Compare	Tank Vapor Space Pressure	AZ.I2.1.1.4	
3.2.1.1.1.35	Alarm	Tank Vapor Space Pressure	AZ.I2.1.1.4	
3.2.1.1.1.36	Control	Tank Vapor Space Pressure	Not Assessed re: AZ.I2.1.5 & AZ.I2.1.6	Administrative function.
3.2.1.1.1.37	Monitor	Tank Flammable Gas Concentration	Non-existent architecture	
3.2.1.1.1.38	Compare	Tank Flammable Gas Concentration	Non-existent architecture	

PROJECT W-314 PDRD CROSS REFERENCE TABLE Instrument & Control Systems				
PDRD FUNCTION ID #	PDRD FUNCTION VERB	PDRD DATA VARIABLE	EQUIPMENT REFERENCE TREE	COMMENTS
3.2.1.1.1.39	Alarm	Tank Flammable Gas Concentration	Non-existent architecture	
3.2.1.1.1.40 3.2.1.2.4 3.2.1.2.5	Control (Maintain, Adjust)	Tank Flammable Gas Concentration Tank Ventilation System Airflow	Non-existent architecture	Administrative function. Trade Study should assess need for tie-in to new HVAC control system may be required.
3.2.1.1.1.41	Monitor	Untreated Gaseous Effluent Temperature	AZ.12.1.3	
3.2.1.1.1.42	Monitor	Treated Gaseous Effluent Radionuclide Particulate Concentrations	AZ.12.1.8	
3.2.1.1.1.42	Monitor	Treated Gaseous Effluent Temperature	AZ.12.1.8	
3.2.1.1.1.42	Monitor	Treated Gaseous Effluent Moisture level	Non-existent architecture	
3.2.1.1.1.42	Monitor	Treated Gaseous Effluent Organic Vapor Concentration	Non-existent architecture	
3.2.1.1.1.42	Monitor	Treated Gaseous Effluent Hazardous/ Toxic Vapor - Particulate Concentrations	Non-existent architecture	

PROJECT W-314 PDRD CROSS REFERENCE TABLE Instrument & Control Systems				
PDRD FUNCTION ID#	PDRD FUNCTION VERB	PDRD DATA VARIABLE	EQUIPMENT REFERENCE TREE	COMMENTS
3.2.1.1.1.43(.1)	Compare	Treated Gaseous Effluent Radionulide Particulate Concentrations	AZ.I2.1.8 See HVAC Assessment	
3.2.1.1.1.43	Compare	Treated Gaseous Effluent Temperature	AZ.I2.1.8	
3.2.1.1.1.43	Compare	Treated Gaseous Effluent Moisture Level	Non-existent architecture	
3.2.1.1.1.43	Compare	Treated Gaseous Effluent Organic Vapor Concentration	Non-existent architecture	
3.2.1.1.1.43(.2)	Compare	Treated Gaseous Effluent Hazardous/ Toxic Vapor - Particulate Concentrations	Non-existent architecture	
3.2.1.1.1.44	Alarm	Treated Gaseous Effluent Radionulide Particulate Concentrations	AZ.I2.1.8	Recorders in 242-A should be functionally replaced.
3.2.1.1.1.44	Alarm	Treated Gaseous Effluent Temperature	Non-existent architecture	
3.2.1.1.1.44	Alarm	Treated Gaseous Effluent Moisture Level	Non-existent architecture	

PROJECT W-314 PDRD CROSS REFERENCE TABLE Instrument & Control Systems				
PDRD FUNCTION ID#	PDRD FUNCTION VERB	PDRD DATA VARIABLE	EQUIPMENT REFERENCE TREE	COMMENTS
3.2.1.1.1.44	Alarm	Treated Gaseous Effluent Organic Vapor Concentration	Non-existent architecture	
3.2.1.1.1.44	Alarm	Treated Gaseous Effluent Hazardous/ Toxic Vapor - Particulate Concentrations	Non-existent architecture	
3.2.1.1.1.45	Control	Treated Gaseous Effluent Radionuclide Particulate Concentrations	Not Assessed re: AZ.I2.1.5 & AZ.I2.1.6	Administrative function.
3.2.1.1.1.45	Control	Treated Gaseous Effluent Temperature	Not Assessed	Administrative function.
3.2.1.1.1.45 3.2.1.2.7	Control	Treated Gaseous Effluent Moisture Level (indirectly) Tank Ventilation System	Non-existent architecture	Administrative function.
3.2.1.1.1.45	Control	Treated Gaseous Effluent Organic Vapor Concentration	Non-existent architecture	Administrative function.
3.2.1.1.1.45 3.2.1.2.8	Control	Treated Gaseous Effluent Hazardous/ Toxic Vapor - Particulate Concentrations (indirectly) Tank Ventilation System	Non-existent architecture	Administrative function.

PROJECT W-314 PDRD CROSS REFERENCE TABLE Instrument & Control Systems				
PDRD FUNCTION ID#	PDRD FUNCTION VERB	PDRD DATA VARIABLE	EQUIPMENT REFERENCE TREE	COMMENTS
3.2.1.1.2.2	Monitor	Essential Transfer Tank Systems/Equipment Operability Status (eg. vent. sys., waste level monitor, etc)	Non-existent architecture	Presently, Operator rounds required.
3.2.1.1.2.3	Monitor	Essential Interconnecting Systems/Equipment Operability Status (eg. heat trace, valves, pumps, etc)	AZ.I6, Not Assessed	Presently, Operator rounds required.
3.2.1.1.2.4	Monitor	Transfer System Operability Status (leak detection system)	AZ.I1.3 AZ.I1.4	Presently, Operator rounds required.
3.2.1.1.2.5	Monitor	Essential Equipment Operability Status	AZ.I6	Presently, Operator rounds required.
3.2.1.1.2.6	Monitor	Waste Parameters Temperature Viscosity Specific Gravity	AZ.I4 AZ.I4.1 AZ.I4.3	
3.2.1.1.2.7	Detect	Waste Transfer System Containment Leaks	AZ.I1.3	
3.2.1.1.2.8	Monitor	Effluents	Non-existent architecture	No effluents in the Tank Farm. Service pit monitors water flow utilized for washdown.
3.2.1.1.2.9	Monitor	Motive Force	See Electrical Assessment (re: AZ.I3.1)	Manual ON-OFF controls, local indicators of ON-OFF condition.
3.2.1.1.2.9	Control	Motive Force	See Electrical Assessment (re: AZ.I3.1)	Manual ON-OFF controls,

PROJECT W-314 PDRD CROSS REFERENCE TABLE Instrument & Control Systems				
PDRD FUNCTION ID.#	PDRD FUNCTION VERB	PDRD DATA VARIABLE	EQUIPMENT REFERENCE TREE	COMMENTS
3.2.1.1.2.10	Monitor	Transfer Route Isolation Devices	I&C Non-existent architecture (re: AZ.I3.3) See Pipeline Assessment	Manual Indication.
3.2.1.1.2.10	Control	Transfer Route Isolation Devices	I&C Non-existent architecture (re: AZ.I3.3) See Pipeline Assessment	Manual Operation.
3.2.1.1.2.11	Monitor	Transfer Line Waste Flow Rate	Non-existent architecture	
3.2.1.1.2.12	Monitor & Compare (Verify)	Transfer Volume	Non-existent architecture	Administrative function.
3.2.1.1.2.13	Alarm (Annunciat e)	Waste Transfer System-Structure- Component Fault(s)	AZ.I1.5	Administrative function. Alarm Status assessed via Operator rounds & via CASS reports.
3.2.1.1.14	Control (Activate)	Waste Transfer Safe Shutdown Systems	AZ.I1.4	
3.2.1.1.2.15	Monitor & Compare (Verify)	Waste Transfer System Safe Shutdown	Non-existent architecture	Function not implemented with I & C. Determine method of implementation in Trade Study.
3.2.1.1.2.16	Control (Secure)	Failed Waste Transfer System Equipment	Non-existent architecture	Function not implemented with I & C. Determine method of implementation in Trade Study.
3.2.1.1.1.3	Manage Obtain Analyze Process Store Archive	System Data/Information	Data Acquisition System Not Assessed AZ.I1.2.1.4 AZ.I2.1.1.5 AZ.I1.6 (re: AZ.I4.4.5)	Chart recorders in 241-A-271 & 242-A should be functionally replaced.
3.2.1.2.3.1	Monitor	Tank Annulus Pressure	AZ.I2.2.1 See HVAC Assessment	Existing equipment is manual, data needs to be connected to TMACS.

PROJECT W-314 PDRD CROSS REFERENCE TABLE Instrument & Control Systems				
PDRD FUNCTION ID#	PDRD FUNCTION VERB	PDRD DATA VARIABLE	EQUIPMENT REFERENCE TREE	COMMENTS
3.2.1.2.3.1	Control (Maintain)	Tank Annulus Pressure	Not Assessed re: AZ.I2.1.5	Manual operator function.
3.2.1.3.4	Monitor	Waste Transfer System Containment Pressure	Non-existent Architecture Not Assessed re: AZ.I3.4 See Pipeline Assessment	
3.2.1.3.4	Control	Waste Transfer System Containment Pressure	Non-existent architecture See Pipeline Assessment	
3.3.1.2.3.1	Monitor	Sludge Volume	AZ.I4.5 Not Assessed	
3.3.4.1.6	Monitor	CAMs Radiation Remote Centralized Data & Alarm Display	Not Assessed	Personel protection monitoring is not monitored by TMACS. Local indication only. PDRD needs to clarify data display needs.

7.2 Functions Assessment Tables

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**EXISTING TANK FARM EQUIPMENT
FUNCTIONS ASSESSMENT TABLE**
INSTRUMENTS & CONTROL SYSTEMS

REF. NO	SYSTEM NAME	FUNCTION OR CONSTRAINT			METHOD OF ANALYSIS I. Analysis II. Inspection III. Testing	BRIEF REASON FOR DECISION
		DESCRIPTION	SOURCE	MET		
AZ.11	LEAK CONTROL SYSTEM	3.2.1.1.2.4 3.2.3.3 3.2.3.4	PDRD	NO	I. See the Engineering Analysis.	Verification of the operability of the transfer route leak sensors is not reliable because of the design of the liquid leak presence sensors and the manual process used to test the sensors. Many of these sensors cannot be calibrated.
AZ.11.1	LEAK DET. PIT/SUMP INST.					
AZ.11.1.1	Gamma Radiation Monitoring Subsystem	3.2.1.1.1.17	PDRD	NO	I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	Sensors must operate underwater. The instrument thimble often contains water due to condensation and possible rainwater infiltration. Minimum detectable liquid leak rates are not defined. System sensitivity specification is not available.
AZ.11.1.2	Weight Factor & Specific Gravity Monitoring Subsystem	3.2.1.1.1.17	PDRD	NO	I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	This equipment is obsolete and uses pneumatics to measure and transmit pressure. Liquid presence and/or level measurement is required. Level is not measured directly, but is calculated from pressure measurements. Better instrumentation exists that does not use instrument air. Degradation of inst. air piping may lead to a degradation of inst. air quality with subsequent pneumatic inst. problems. Operations desires to eliminate the need for Inst. Air.
AZ.11.1.3	Liquid Presence Sensor and Buried wiring	3.2.1.1.1.17	PDRD, WAC-173-303- #1604(c)(iii), 40CFR-Ch1- #265.193(c)(3)	NO	I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	A Trade Study should verify the need for this architecture. The existing device will not measure low leak rates due to its design. The wiring in the pits is not NEC code compliant. "SO" cords are not suitable for outside or buried use.
AZ.11.1.4	Liquid Temperature Sensor	3.2.1.1.1.17	PDRD	YES	I. See the Engineering Analysis.	Although this device meets PDRD requirements, it could be eliminated as redundant instr. as it adds little value to leak detection.
AZ.11.2	ANNULUS LEAK INSTRUMENTATION	Secondary Containment Leak Detection	40CFR- CH1: #265.193(C)(3) WAC-173-303	NO	I. See the Engineering Analysis.	Leakage from secondary tank walls may be absorbed in the soil and not be detected. Note: Secondary containment floor leaks may be detected by the Leak Detection Pit systems.

**EXISTING TANK FARM EQUIPMENT
FUNCTIONS ASSESSMENT TABLE**
INSTRUMENTS & CONTROL SYSTEMS

REF. NO	SYSTEM NAME	FUNCTION OR CONSTRAINT			METHOD OF ANALYSIS I. Analysis II. Inspection III. Testing	BRIEF REASON FOR DECISION
		DESCRIPTION	SOURCE	MET		
AZ.11.2.1	Annulus CAM Radiation Monitoring Subsystem	1. 3.2.1.1.1.1.7	PDRD 40CFR- CH1-#265.193(c)(3) WAC-173-303	YES ¹	I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	This system is too sensitive to Radon gas, which yields excessive false alarms. Maintenance/calibration of the system is difficult because of lifting requirements. The recorder requires extensive maintenance. Cabinets are in need of rework. A Trade Study should be carried out to determine the efficiency of this type of instrument and the appropriateness of this application.
AZ.11.2.2	Annulus Liquid Presence Multiple Sensor Conductivity Probes	3.2.1.1.1.1.7	PDRD WAC-173-303- #160(d)(c)(iii) 40CFR-CH1- #265.193(c)(3)	NO	I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	Device must detect low liquid leak rates. The device has no method to verify the operability of the sensors. The device cannot be calibrated. This device requires an Operator to attach a meter and manually readout liquid presence data. Monitoring Frequency requirements suggest a need for automatic monitoring & recording.
AZ.11.2.3	Annulus Pump Pit Liquid Presence Sensor	3.2.1.1.2.7	PDRD	NO	I. See the Engineering Analysis.	See AZ.11.3.3
AZ.11.3	PIPELINE LEAK INSTRUMENTATION	3.2.1.1.2.7 Secondary Containment Leak Detection	PDRD WAC-173- 303#160(d)(c)(iii) 40CFR- CH1#265.193(c)(3)	NO	I. See the Engineering Analysis.	The detection system cannot detect a failure of pipeline secondary containment. The detection system cannot detect a failure of the various "Transfer Pits". A Trade Study should pull together the various environmental interpretations, permits and waiver requests to confirm the need for this system.
AZ.11.3.1	C.O.B. Liquid Presence Sensor	3.2.1.1.2.7	PDRD WAC-173-303- #160(d)(c)(iii) 40CFR-CH1- #265.193(c)(3)	NO	I. See the Engineering Analysis. IIb. See Elec. CAS data sheets.	The sensor will not detect low leak rates due to its design. Its operability cannot be easily verified and it cannot be functionally tested with existing electrical circuitry. The installation has NEC Code compliance issues. Existing wiring insulation is brittle and cracked. Current sensitive relays are not (& cannot be) calibrated.

EXISTING TANK FARM EQUIPMENT FUNCTIONS ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS						
REF. NO	SYSTEM NAME	FUNCTION OR CONSTRAINT			METHOD OF ANALYSIS I. Analysis II. Inspection III. Testing	BRIEF REASON FOR DECISION
		DESCRIPTION	SOURCE	MET		
AZ.11.3.2	Pipeline Pressure Switch Sensor	3.2.1.1.2.10 3.2.1.3.4	PDRD	NO	I. See the Engineering Analysis.	Adequate "status of the route isolation" is not provided for all the transfer routes. This will require an Engineering analysis to determine if more pressure switches are required.
AZ.11.3.3	Transfer Pits Instruments (LDE only)	3.2.1.1.2.7	PDRD WAC-173-303- #160(4)(c)(iii), 40CFR Ch 1- #265.193(c)(3)	NO	I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	The pit sensor will not detect low leak rates due to its design. Its operability cannot be easily verified and it cannot be functionally tested with existing electrical circuitry. Current sensitive relays are not (& cannot be) calibrated. Rain and melting snow infiltration are often causes of false alarms. The wiring is bad and in general does not comply with NEC requirements. "SO" cord is not rated for outside or buried applications. The terminal boxes that house the field alarm lamps have had their NEMA rating ruined by incorrect modifications. Wiring inside boxes has badly deteriorated insulation. The sensor in the central pump pit of tanks with flammable atmospheres is a concern as a potential ignition source.
AZ.11.4	PUMP PERMISSIVE INSTRUMENTATION {Master Pump shutdown}	3.2.1.1.2.9 3.2.1.1.2.10 3.2.1.3.10	PDRD	NO	I. See the Engineering Analysis.	The existing system does not allow interlock versatility. (Its all or nothing.) You can not set up a transfer route and have only the appropriate leak sensors for that route active.
AZ.11.4.4	[242-A Relay Panel]	3.2.1.1.2.9 3.2.1.1.2.10 3.2.1.3.10	PDRD	NO	I. See the Engineering Analysis.	See other tank farm tables for decision reasons.

EXISTING TANK FARM EQUIPMENT FUNCTIONS ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS						
REF. NO	SYSTEM NAME	FUNCTION OR CONSTRAINT			METHOD OF ANALYSIS I. Analysis II. Inspection III. Testing	BRIEF REASON FOR DECISION
		DESCRIPTION	SOURCE	MET		
AZ.11.5	LOCAL ALARM ANNUNCIATION PANEL	3.2.1.1.2.2 3.2.1.1.2.3 3.2.1.1.2.4 3.2.1.1.2.5 3.2.1.1.2.13 3.2.1.1.1.3	PDRD	NO	I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	System indicators, in general, do not appear to comply with NUREG-0700 design guidelines which deal with alarm identification. Replacement of the leak detection and M.P.S. systems may render part of the old PANALARM non-functional. re: AZ.11.3.4 The terminal boxes that house the field alarm lamps are not water tight (NEMA violation). re: AY.11.5.3 This system relies on old Hanford custom designed communication equipment to interface to the CASS system. The interface is obsolete and part procurement is difficult.
AZ.11.6	REMOTE ALARM SIGNALING (GAMERWELL LOOP)	3.2.1.1.3	PDRD	NO	I. See the Engineering Analysis. IIa. See Field Inspection Questionnaire.	This Signaling system does not allow identification of individual leak sensing elements. The system has a long history of maintenance problems and spare parts are not readily available.
AZ.11.7	TANK WASTE HIGH LEVEL ALARM SUBSYSTEM	3.2.1.1.1.5	PDRD	NO	I. See the Engineering Analysis.	Verification of the operability of these high level sensors is not reliable because of the design of the liquid presence sensors. An electrical verification is not possible because of the design. These sensors cannot be calibrated. In tanks with flammable atmosphere there is a concern that this system may be an ignition source. The current sensitive relays are not (& cannot be) calibrated with the sensor.
AZ.12	VENTILATION CONTROL SYSTEM					
AZ.12.1	TANK PRIMARY VENTILATION SYSTEM					

EXISTING TANK FARM EQUIPMENT FUNCTIONS ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS						
REF. NO	SYSTEM NAME	FUNCTION OR CONSTRAINT			METHOD OF ANALYSIS I. Analysis II. Inspection III. Testing	BRIEF REASON FOR DECISION
		DESCRIPTION	SOURCE	MET		
AZ.12.1.1	Tank Diff. Pressure Instr. Subsystem	3.2.1.1.1.33 3.2.1.1.1.34 3.2.1.1.1.35	PDRD	NO	I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	This equipment is obsolete and uses pneumatics to measure and transmit pressure data. Better equipment exists which does not use instrument air. The instrument air system has problems which may cause unreliable performance. Future procurement of spares may be difficult because the technology is obsolete. Old chart recorders do not connect to Electronic Database directly, thus record keeping requires handling paper strips. These recorders often require extensive maintenance. Pressure measurement data should be automatically sent to electronic Database. Removal of the cabinets should be considered for upgrade work.
AZ.12.1.2	HEPA Filter Diff. Pressure Instr.	3.2.1.2.9 3.2.3	PDRD		Not assessed.	Project W-030 upgrade.
AZ.12.1.3	Temperature Instrumentation	3.2.1.1.1.41	PDRD		Not assessed.	Project W-030 upgrade.
AZ.12.1.4	Heater Control Subsystem	3.2.1.1.1.41	PDRD		Not assessed.	Project W-030 upgrade.
AZ.12.1.5	Fan-Motor Control Subsystem	3.2.1.2.9 3.2.1.2.10 3.2.3	PDRD		Not assessed.	Project W-030 upgrade.
AZ.12.1.6	Damper Control Subsystem	3.2.1.2.10	PDRD		Not assessed.	Project W-030 upgrade.
AZ.12.1.8	Regulated Stack Monitoring System ()	3.2.1.1.1.42 Inst. Sensitivity (DCG)	PDRD WHC-SD-EN-TI-288	NO	I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	System does not comply with WDOE requirements.
AZ.12.1.9	Exhaust Condenser Subsystem Instruments	3.2.3	PDRD		Not assessed.	Project W-030 upgrade.
AZ.12.2	TANK ANNULUS VENTILATION SYSTEM					
AZ.12.2.1	Annulus Diff. Pressure Subsystem	3.2.1.2.3.1	PDRD		Not Assessed.	Project W-030 upgrade.

**EXISTING TANK FARM EQUIPMENT
FUNCTIONS ASSESSMENT TABLE**
INSTRUMENTS & CONTROL SYSTEMS

INSTRUMENTATION & CONTROL SYSTEMS							
REF. NO	SYSTEM NAME	FUNCTION OR CONSTRAINT			METHOD OF ANALYSIS I. Analysis II. Inspection III. Testing	BRIEF REASON FOR DECISION	
		DESCRIPTION	SOURCE	MET			
AZ.13	TRANSFER LINE CONTROL SYSTEM	3.2.1.1.2.5 3.2.1.1.2.8	PDRD	NO	I. See the Engineering Analysis.	(Effluents are not monitored.)	
AZ.13.1	PUMP CONTROL SUBSYSTEM	3.2.1.1.2.9	PDRD	NO	I. See the Engineering Analysis.	Monitoring of Motive Force Devices is minimal, eg. no current monitoring is carried out.	
AZ.13.2	VALVE POSITION INSTRUMENTATION/ INDICATION	3.2.1.1.2.10	PDRD	NO	I. See the Engineering Analysis.	Transfer route identification cannot be electronically verified because valve position is not remotely monitored. Limit switches are problematic, but new technology exists which could provide continuous position indication.	
AZ.13.3	VALVE CONTROL SYSTEM	3.2.1.1.2.10	PDRD	NO	I. See the Engineering Analysis.	Motorized valve control does not exist.	
AZ.13.4	PRESSURE SWITCH INSTRUMENTATION (Flow Indication)	3.2.1.1.2.9	PDRD	NO	I. See the Engineering Analysis.	Requirements for pipeline pressure sensor for monitoring misrouting is not clearly defined in the PDRD. Transfer route identification cannot be electronically verified because all pipelines are not monitored for pressure or flow. The PDRD should clarify which pipelines require this data function.	
AZ.13.5	WASTE FLOW MONITORING INSTRUMENTATION (Service Pit & Flush Pit)	3.2.1.1.2.11	PDRD	NO	I. See the Engineering Analysis.	Waste Flow Inst., in general, does not exist. The PDRD should specify which pipelines require this type of instrumentation.	
AZ.13.5.1	Service Pit Instrument Subsystems						
AZ.13.5.1.1	Flow Monitor & Totalizer	3.2.1.1.2.11	PDRD		Not assessed		
AZ.13.5.1.2	Radiation (Gamma) Monitor					Not assessed. The PDRD does not clearly define this function.	
AZ.13.5.1.3	Pipeline Pressure Sensor	3.2.1.1.2.9	PDRD		Relates to AZ.13.4	Not assessed.	
AZ.14	TANK CONTENTS MONITORING SYSTEM	3.2.1.1.2.6	PDRD	NO	I. See the Engineering Analysis.	Real-time monitoring systems for these (physical) parameters (viscosity, specific gravity, etc), in general, do not exist.	

EXISTING TANK FARM EQUIPMENT FUNCTIONS ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS						
REF. NO	SYSTEM NAME	FUNCTION OR CONSTRAINT		METHOD OF ANALYSIS		BRIEF REASON FOR DECISION
		DESCRIPTION	SOURCE	MET	I. Analysis II. Inspection III. Testing	
AZ.14.1	TEMPERATURE/VAPOR INSTRUMENTATION	3.2.1.1.1.9 3.2.1.1.1.25 3.2.1.2.1.1.1	PDRD	NO	I. See the Engineering Analysis.	Old style trees do not allow replacement of failed temperature sensor element. Temperature elements are type "J" which is susceptible to corrosion. Temperature trees that do not have removable sensors are candidates for replacement. Note: All existing trees cannot withstand mixer pump forces. (Retrieval projects may install new trees.)
AZ.14.3	CHEMICAL COMPOSITION MONITORING	3.2.1.1.1.1 3.2.1.1.1.2.1.1 3.2.1.1.1.2.1.2	PDRD	NO	I. See the Engineering Analysis.	An installed real-time chemical analyzer does not exist. This is a manual effort; analysis is carried out by laboratory & is infrequently done. The PDRD should clarify the sampling frequency for each data type.
AZ.14.3.1	Weight Factor & Loop Seal Instrumentation	3.2.1.1.1.2.1.2	PDRD	NO	I. See the Engineering Analysis.	This equipment is obsolete. Acquisition of spare parts in the future may be difficult. Future Manufacturer support for these types of instrumentation is uncertain. This system utilizes instrument air. Instrument air quality is an issue. Density is not measured directly, but is calculated from air pressure measurements. This complicates the calibration function and the device may not read accurately. The PDRD should reassess the need for this real-time monitoring system for these tanks.
AZ.14.4	TANK LIQUID SURFACE LEVEL INSTRUMENTATION	3.2.1.1.1.5 3.2.1.1.1.13 3.2.1.1.2.12	PDRD	NO, YES ₂	I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	The existing FIC gauges achieve poor resolution and require extensive maintenance. Spare parts procurement is a problem. This device must satisfy need for Mass Balance & Tank Inventory. When Enraf level gauges are installed to replace the old FIC, the Enraf CIU will be required to send digital data directly to TMACS Central in order to remotely report a full range (Top of level to bottom of tank).

EXISTING TANK FARM EQUIPMENT FUNCTIONS ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS						
REF. NO	SYSTEM NAME	FUNCTION OR CONSTRAINT			METHOD OF ANALYSIS I. Analysis II. Inspection III. Testing	BRIEF REASON FOR DECISION
		DESCRIPTION	SOURCE	MET		
AZ.14.5	SLUDGE WEIGHT (LEVEL) MONITORING PROBE	3.2.1.1.1.1	PDRD	YES	I. See the Engineering Analysis.	The device resolution is unknown but is expected to be poor. It requires an Operator to enter the farm to operate and the acquired level data is subject to Operator interpretation. This device is expensive to fabricate.
AZ.15	TANK CONTENTS MIXING & HEATING SYSTEMS	Not in PDRD			I. See the Engineering Analysis	This function is missing from the PDRD and should be added.
AZ.15.1	AIR LIFT CIRCULATOR CONTROL SYSTEM					
AZ.15.1.1	Diff. Pressure Sensors				I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	These sensors are manually read. A Trade Study should determine if the data acquisition should be automated.
AZ.15.1.2	Local Indication					
AZ.15.1.3	Flow Cutoff Valve					
AZ.15.1.4	Gamma Detector Check Valve Caisson				Not assessed.	The PDRD does not clearly define the need for this function.
AZ.15.1.5	Count Rate Meters Check Valve Caisson [241-A-271]				Not assessed.	The PDRD does not clearly define the need for this function.
AZ.15.3	STEAM HEAT CONTROL/INSTRUMENTATION				Not Assessed	These sensors are manually read. A Trade Study should determine if the data acquisition should be automated.
AZ.16	SCC STATUS/MONITORING SYSTEM AC POWER SUPPLY STATUS AIR SUPPLY STATUS WATER SUPPLY STATUS HEAT TRACE SYS. STATUS CATHODIC PROT. SYS. STATUS Other	3.2.1.1.2.1 3.2.1.1.2.3	PDRD	NO	I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	A status summary alarm panel for all these subsystems doesn't exist. Some status are available on the old PANALARM panels. Some of the data is obtained from operator rounds. Replacement of the various instrument systems may render much of the old PANALARM non-functional.

EXISTING TANK FARM EQUIPMENT FUNCTIONS ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS						
REF. NO	SYSTEM NAME	FUNCTION OR CONSTRAINT			METHOD OF ANALYSIS I. Analysis II. Inspection III. Testing	BRIEF REASON FOR DECISION
		DESCRIPTION	SOURCE	MET		
AZ.16.4	TANK CONCRETE STRUCTURE TEMPERATURE INST.	3.2.1.1.1.29 3.2.1.2.1.1.2	PDRD	NO	I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets	The data loggers are obsolete. Future spare parts procurement will be a problem. The PDRD should specify which thermocouples require real-time monitoring.
AZ.17	HEAT TRACE CONTROL SYSTEM	3.2.1.3	PDRD	-	Not assessed	The PDRD should define which pipelines need this function.
AZ.18	CATHODIC PROTECTION CONTROL SYSTEM	3.2.1.3.5 Testing requirement	PDRD WAC-173-303 #640	NO ¹	I. See the Engineering Analysis.	¹ The existing system doesn't seem to comply with the testing capability requirements for cathodic protection systems i.a.w. WAC.

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7.3 Architecture Tree Tables

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Level 1

Level 2

Level 3

Level 3

Level 2

LEAK CONTROL
SYSTEM
AZ.11

Level 3

LEAK DETECTION
PIT/SUMP
INSTRUMENTATION
AZ.11.1

Level 4

Gamma Radiation
Monitoring
Subsystem
AZ.11.1.1

Weight Factor &
Specific Gravity
Monitoring Subsystem
AZ.11.1.2

Liquid Presence
Sensor
(Pump Pit)
AZ.11.1.3

Liquid Temperature
Sensor
AZ.11.1.4

Level 2

Level 3

Level 4

Level 5

Level 2

Level 3

Level 4

Level 2

LEAK CONTROL
SYSTEM
AZ.11

Level 3

ANNULUS LEAK
INSTRUMENTATION
AZ.11.2

Level 4

CAM Radiation
Monitoring
Subsystem
AZ.11.2.1

Level 5

Air Sampler
Probe/Tubing/etc
AZ.11.2.1.1

Radiation
Analyzer
AZ.11.2.1.2

Cabinet
AZ.11.2.1.3

Recorder
& Alarms
AZ.11.2.1.4

Signal
Wiring/Conduit
AZ.11.2.1.5

Level 2

Level 3

Level 4

Level 2

LEAK CONTROL
SYSTEM
AZ.11

Level 3

PIPELINE LEAK
INSTRUMENTATION
AZ.11.3

Level 4

Transfer Pit
Leak Detection
Instrumentation
AZ.11.3.3

Level 5

Pit
Liquid Presence
Sensor
AZ.11.3.3.1

Pit
Control Station
AZ.11.3.3.2

Pit Signal
Wiring/Conduit/
Terminal Boxes
AZ.11.3.3.3

Level 2

Level 3

Level 4

Level 2

Level 3

Level 4

Level 2

Level 3

Level 4

Level 2

Level 2

VENTILATION
CONTROL SYSTEM
AZ.12

Level 3

TANK PRIMARY
VENTILATION
SYSTEM
AZ.12.1

Level 4

Tank
Diff. Pressure
Inst. Subsystem
AZ.12.1.1

Level 5

Tank Riser Tubing
to Pressure
Sensor/Transmitter
AZ.12.1.1.1

Pressure
Sensor/Transmitter
AZ.12.1.1.2

Field Instrument Air
Tubing
AZ.12.1.1.3

Pressure
Switch/Alarm
AZ.12.1.1.4

Pressure
Recorders
AZ.12.1.1.5

Level 2

Level 3

Level 4

Level 5

Level 2

Level 3

Level 2

Level 3

Level 2

Level 3

Level 4

Level 2

TANK CONTENTS
MONITORING
SYSTEM
AZ.14

Level 3

CHEMICAL COMPOSITION
MONITORING
INSTRUMENTATION
AZ.14.3

Level 4

WEIGHT FACTOR
& LOOP SEAL
INSTRUMENTATION
AZ.14.3.1

Level 2

Level 3

Level 4

Level 2

Level 3

Project W-151 : AZ-101
Project W-211 : AZ-102

Level 2

Level 3

Level 4

Level 2

Level 2

Level 3

Level 4

Level 2

7.4 Drawing Reference Tables

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EXISTING TANK FARM EQUIPMENT SYSTEM DRAWING REFERENCES INSTRUMENTS & CONTROL SYSTEMS				
REF NO.	SYSTEM NAME	DRAWING REFERENCES	NO. OF ECNs OUTSTANDING	PD/RD REFERENCE
AZ.11	LEAK CONTROL SYSTEM	H-2-68335	0	3.2.1.1.2.4
AZ.11.1	LEAK DET. PIT/SUMP INST.	H-2-68335	0	
AZ.11.1.1	Gamma Radiation Monitoring Subsystem	H-2-68335, H-2-68343	0	3.2.1.1.1.17
AZ.11.1.1.1	Gamma Probe Well Structure	H-2-68335, H-2-68343	0	
AZ.11.1.1.2	Gamma Probe & Well Cable	H-2-68335, H-2-68343	0	
AZ.11.1.1.3	Field Signal Cable	H-2-68322	0	
AZ.11.1.1.4	reserved			
AZ.11.1.1.5	Count Rate Meters/ Alarm Comparators.	H-2-68335, H-2-68336	12	
AZ.11.1.2	Weight Factor & Specific Gravity Monitoring Subsystem	H-2-68335, H-2-68338	3	3.2.1.1.1.17
AZ.11.1.2.1	Sample Tubes (Leak Det. Ptg)	H-2-68335	0	
AZ.11.1.2.2	Weight Factor & Specific Gravity Pressure Sensors	H-2-68335, H-2-68338	3	
AZ.11.1.2.3	Weight Factor Cabinet	H-2-68335, H-2-68338	3	
AZ.11.1.2.4	Field Tubing	H-2-68335, H-2-68338	3	
AZ.11.1.2.5	W.F. & SpG Pressure Switches & Indicators (Inst. Panel & Press. SW Rack)	H-2-68335, H-2-68336	12	
AZ.11.1.3	Liquid Presence Sensor and Buried wiring	H-2-68335	0	3.2.1.1.1.17
AZ.11.1.4	Liquid Temperature Sensor	H-2-68335	0	3.2.1.1.1.17
AZ.11.2	ANNULUS LEAK INSTRUMENTATION	H-2-68335	0	Secondary Containment Leak Detection
AZ.11.2.1	Annulus CAM Radiation Monitoring Subsystem	H-2-92976	2	3.2.1.1.1.17
AZ.11.2.1.1	Air Sampler Probe/ Tubing/ etc	H-2-92976	2	
AZ.11.2.1.2	Radiation Analyzer	H-2-92976	2	

EXISTING TANK FARM EQUIPMENT SYSTEM DRAWING REFERENCES INSTRUMENTS & CONTROL SYSTEMS				
REF NO.	SYSTEM NAME	DRAWING REFERENCES	NO. OF ECNs OUTSTANDING	PORD REFERENCE
AZ.II.2.1.3	Cabinet s	H-2-92976	2	
AZ.II.2.1.4	Recorder & Alarms			
AZ.II.2.1.5	Signal Wiring/ Conduit	H-2-68322	0	
AZ.II.2.2	Annulus Liquid Presence Sensor (Flake Box & Manual Tape Conductivity Probe)	H-2-68335	0	3.2.1.1.1.17
AZ.II.2.3	Annulus Pump Pit Liquid Presence Sensor	H-2-68335	0	
AZ.II.3	PIPELINE LEAK INSTRUMENTATION	H-2-68335, H-2-74600	1	3.2.1.1.2.7 Secondary Containment Leak Detection
AZ.II.3.1	C.O.B. Liquid Presence Sensor	H-2-34965, H-2-70796	0	3.2.1.1.2.7
AZ.II.3.2	Pipeline Pressure Switch Sensor	N/A		3.2.1.1.2.10 3.2.1.3.4
AZ.II.3.3	Transfer Pit Instruments (LDE only)	H-2-68335	0	3.2.1.1.2.7
AZ.II.3.3.1	Pit Liquid Presence Sensor	H-2-68335, H-2-34965	0	
AZ.II.3.3.2	reserved			
AZ.II.3.3.3	Pit Signal Wiring/Conduit/TBX	H-2-34965, H-2-68322	0	
AZ.II.3.4	Field Signal Wiring/ Conduit/ Terminal Boxes	H-2-68322	0	
AZ.II.3.5	Encasement Leak Detection Pit Instruments (AZ farm only)	H-2-70796	0	
AZ.II.4	PUMP PERMISSIVE INSTRUMENTATION (Master Pump shutdown)	H-2-74600	1	3.2.1.1.2.9 3.2.1.1.2.10 3.2.1.3.10
AZ.II.4.1	Master Pump Shutdown Rel Panel			3.2.1.1.2.9 3.2.1.1.2.10 3.2.1.3.10
AZ.II.4.3	Signal Wiring/Conduit/TBX	H-2-68322	0	
AZ.II.4.4	[242-A Rel Panel]			

EXISTING TANK FARM EQUIPMENT SYSTEM DRAWING REFERENCES INSTRUMENTS & CONTROL SYSTEMS				
REF NO.	SYSTEM NAME	DRAWING REFERENCES	NO. OF ECNs OUTSTANDING	PDR REFERENCE
AZ.11.5	LOCAL ALARM ANNUNCIATION PANEL			3.2.1.1.2.2 3.2.1.1.2.3 3.2.1.1.2.4 3.2.1.1.2.5 3.2.1.1.2.13 3.2.1.1.3
AZ.11.5.1	Alarm Panel (241-A-271)			
AZ.11.5.2	??? Tank Farm Alarm Panel			
AZ.11.5.3	CASS Alarm Panel Interface	H-2-68335, H-2-71550	0	
AZ.11.6	REMOTE ALARM SIGNALING (GAMWELL LOOP)	H-2-71804, H-2-71805	0	3.2.1.1.3
AZ.11.7	TANK WASTE HIGH LEVEL ALARM SUBSYSTEM	H-2-68355	0	
AZ.11.7.1	Waste Liquid High Level Probe	H-2-68342	1	
AZ.11.7.2	Tank Farm Alarm Panels			
AZ.11.7.3	Signal Wiring/Conduit/TBX	H-2-68322	0	
AZ.12	VENTILATION CONTROL SYSTEM	H-2-64462, H-2-92066 (W-030 UPGRADE 131075)	0	
AZ.12.1	TANK PRIMARY VENTILATION SYSTEM	H-2-64462, H-2-92066 (W-030 UPGRADE 131075)	0	
AZ.12.1.1	Tank Diff. Pressure Instr. Subsystem	H-2-68335, H-2-68338	3	3.2.1.1.1.33 3.2.1.1.1.34 3.2.1.1.1.35
AZ.12.1.1.1	Tank Riser Tubing to Pressure Sensor/Transmitter	H-2-68338 (W-030 UPGRADE H-2-131075)	3	
AZ.12.1.1.2	Pressure Sensor/Transmitter	H-2-68338 (W-030 UPGRADE H-2-131075)	3	
AZ.12.1.1.3	Field Instrument Air Tubing (???)	H-2-68338 (W-030 UPGRADE H-2-131075)	3	
AZ.12.1.1.4	Pressure Switch/Alarm	H-2-68336 (W-030 UPGRADE H-2-131075)	12	
AZ.12.1.1.5	Pressure Recorder	H-2-68336 (W-030 UPGRADE H-2-131075)	12	
AZ.12.1.2	HEPA Filter Diff. Pressure Instr.	H-2-64462, H-2-92066 (W-030 UPGRADE H-2-131075)	0	
AZ.12.1.3	Temperature Instrumentation	H-2-64462, H-2-92066 (W-030 UPGRADE H-2-131075)	0	3.2.1.1.1.41

EXISTING TANK FARM EQUIPMENT SYSTEM DRAWING REFERENCES INSTRUMENTS & CONTROL SYSTEMS				
REF NO.	SYSTEM NAME	DRAWING REFERENCES	NO. OF ECNs OUTSTANDING	PDRD REFERENCE
AZ.12.1.4	Heater Control Subsystem	H-2-64462, H-2-92066 (W-030 UPGRADE H-2-131075)	0	
AZ.12.1.5	Fan-Motor Control Subsystem	H-2-64462, H-2-92066 (W-030 UPGRADE H-2-131075)	0	
AZ.12.1.6	Damper Control Subsystem	N/A - MANUAL (W-030 UPGRADE H-2-131075)		
AZ.12.1.7				
AZ.12.1.8	Regulated Stack Monitoring System ()	H-2-93924 (W-030 UPGRADE H-2-131075)	0	3.2.1.1.1.42
AZ.12.1.8.1	<i>Tubing from Stack to CAM</i>	H-2-93924 (W-030 UPGRADE H-2-131075)	0	
AZ.12.1.8.2	<i>CAMs Radiation Analyzers</i>	H-2-93924 (W-030 UPGRADE H-2-131075)	0	
AZ.12.1.8.3	<i>CAM Cabinets</i>	H-2-93924 (W-030 UPGRADE H-2-131075)	0	
AZ.12.1.8.4	<i>Vacuum Pumps</i>	H-2-93924 (W-030 UPGRADE H-2-131075)	0	
AZ.12.1.8.5	<i>Recorder (242-A)</i>	H-2-93924 (W-030 UPGRADE H-2-131075)	0	
AZ.12.2	TANK ANNULUS VENTILATION SYSTEM	H-2-92864	0	
AZ.12.2.1	Annulus Diff. Pressure Subsystem	H-2-68335, H-2-68338	3	3.2.1.2.3.1
AZ.13	TRANSFER LINE CONTROL SYSTEM			3.2.1.1.2.5 3.2.1.1.2.8
AZ.13.1	PUMP CONTROL SUBSYSTEM	H-2-70796	0	3.2.1.1.2.9
AZ.13.2	VALVE POSITION INSTRUMENTATION/ INDICATION	N/A		3.2.1.1.2.10
AZ.13.3	VALVE CONTROL SYSTEM	N/A		3.2.1.1.2.10
AZ.13.4	PRESSURE SWITCH INSTRUMENTATION (Flow Indication)	N/A		3.2.1.1.2.9
AZ.13.5	WASTE FLOW MONITORING INSTRUMENTATION (Service Pit & Flush Pit)	N/A		3.2.1.1.2.11
AZ.13.5.1	Service Pit Instrument Subsystems	H-2-68335	0	
AZ.13.5.1.1	<i>Flow Monitor & Totalizer</i>			

EXISTING TANK FARM EQUIPMENT SYSTEM DRAWING REFERENCES INSTRUMENTS & CONTROL SYSTEMS				
REF NO.	SYSTEM NAME	DRAWING REFERENCES	NO. OF ECNs OUTSTANDING	PDRD REFERENCE
AZ.I3.5.1.2	Radiation (Gamma) Monitor			
AZ.I3.5.1.3	Pipeline Pressure Sensor	H-2-68335	0	
AZ.I4	TANK CONTENTS MONITORING SYSTEM	H-2-68335, H-2-79207 (101-AZ ONLY)	0	3.2.1.1.2.6
AZ.I4.1	TEMPERATURE/VAPOR INSTRUMENTATION	H-2-68336, H-2-79207 (101-AZ ONLY)	12	3.2.1.1.1.9 3.2.1.1.1.25 3.2.1.2.1.1.1
AZ.I4.1.1	Thermocouple Probes	H-2-78973 (101-AZ ONLY)	2	
AZ.I4.1.2				
AZ.I4.1.3				
AZ.I4.2	STANDARD HYDROGEN MONITORING SYSTEM	N/A		3.2.1.1.1.37
AZ.I4.2.1	Gas Flow Instrumentation	N/A		
AZ.I4.2.2	H ₂ Concentration - Low Range Instrumentation	N/A		
AZ.I4.2.3	H ₂ Concentration - High Range Instrumentation	N/A		
AZ.I4.2.4	Gas Temperature Instrumentation	N/A		
AZ.I4.2.5	3 Pen Recorder	N/A		
AZ.I4.3	CHEMICAL COMPOSITION MONITORING			3.2.1.1.1.1 3.2.1.1.1.2.1.1 3.2.1.1.1.2.1.2
AZ.I4.3.1	Weight Factor & Loop Seal Instrumentation	H-2-64400	0	3.2.1.1.1.2.1.2
AZ.I4.4	TANK LIQUID SURFACE LEVEL INSTRUMENTATION	H-2-68335, H-2-68342	1	3.2.1.1.1.5 3.2.1.1.1.13 3.2.1.1.2.1.2
AZ.I4.4.1	FIC/Enraf Riser Extension	H-2-36382, H-2-817634	45	
AZ.I4.4.2	FIC/Enraf Level Sensor	H-2-36382, H-2-817634	45	
AZ.I4.4.4	reserved			

EXISTING TANK FARM EQUIPMENT SYSTEM DRAWING REFERENCES INSTRUMENTS & CONTROL SYSTEMS				
REF. NO.	SYSTEM NAME	DRAWING REFERENCES	NO. OF ECNs OUTSTANDING	PDRD REFERENCE
AZ.14.4.4	Signal Cables/Terminal Boxes	H-2-36378, H-2-36382, H-2-817634	48	
AZ.14.4.5	Enraf/CASS Digital Interface	H-2-71801, H-2-71802, H-2-71803 (PIC)	6	
AZ.14.5	SLUDGE WEIGHT (LEVEL) MONITORING	H-2-68335, H-2-68342	1	
AZ.15	TANK CONTENTS MIXING & HEATING SYSTEMS	H-2-78870 (W-151 MIXING PUMP)	0	
AZ.15.1	AIR LIFT CIRCULATOR CONTROL SYSTEM	H-2-68335	0	
AZ.15.1.1	Diff. Pressure Sensors	H-2-68335	0	
AZ.15.1.2	Local Indication	H-2-68335	0	
AZ.15.1.3	Flow Cutoff Valve	H-2-68335	0	
AZ.15.1.4	Gamma Detectors Check Valve/Caisson (AZ only)	H-2-68335	0	
AZ.15.1.5	Count Rate Meters Check Valve Caisson (241-A-271 for AZ only)	H-2-68335	0	
AZ.15.3	STEAM HEAT CONTROL/INSTRUMENTATION	H-2-64400	0	
AZ.16	SCC STATUS/MONITORING SYSTEM			3.2.1.1.2.1 3.2.1.1.2.3
AZ.16.1	AC POWER SUPPLY STATUS INST.	H-2-68322	0	
AZ.16.2	AIR SUPPLY STATUS INST.	H-2-68335	0	
AZ.16.3	WATER SUPPLY STATUS INST.	H-2-68335	0	
AZ.16.4	TANK CONCRETE STRUCTURE TEMPERATURE INST.	H-2-68335, H-2-68336	12	3.2.1.1.1.29 3.2.1.2.1.2
AZ.16.4.1	Data Logger (See CASS Assessment)	H-2-68335, H-2-68336	12	
AZ.16.4.2	Manual Readout Panel	N/A - HAND HELD ONLY		
AZ.16.4.3	Signal Wiring/Terminal Boxes	H-2-68337	0	

EXISTING TANK FARM EQUIPMENT SYSTEM DRAWING REFERENCES INSTRUMENTS & CONTROL SYSTEMS				
REF NO.	SYSTEM NAME	DRAWING REFERENCES	NO. OF ECNs OUTSTANDING	PDRD REFERENCE
AZ.I6.5	HEAT TRACE SYSTEM STATUS INST.			
AZ.I6.6	CATHODIC PROTECTION SYSTEM STATUS INST.	H-2-77321, H-2-77322, (W-030 UPGRADE H-2-131378)	0	
AZ.I7	HEAT TRACE CONTROL SYSTEM	See the AY tank farm architecture.	0	3.2.1.3
AZ.I8	CATHODIC PROTECTION CONTROL SYSTEM	H-2-77321, H-2-77322, (W-030 UPGRADE H-2-131378)	0	3.2.1.3.5 Testing requirement
AZ.I8.1	POWER CONTROLLER	H-2-77321, H-2-77322, (W-030 UPGRADE H-2-131378)	0	
AZ.I8.2	WIRING/CONDUIT/TBX	H-2-77321, H-2-77322, (W-030 UPGRADE H-2-131378)	0	

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7.5 Special Testing

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7.6 Field Assessment Questionnaire

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EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS			
REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AZ.11	LEAK CONTROL SYSTEM		
AZ.11.1	LEAK DET. PIT/SUMP INST.		
AZ.11.1.1	Gamma Radiation Monitoring Subsystem	<p>Inspect instrument cables where accessible.</p> <p>Inspect wiring where accessible.</p> <p>Inspect instrument tubing where accessible.</p> <p>Inspect instrument and cabinets/terminal boxes for corrosion.</p> <p>Estimate age of equipment.</p> <p>Estimate maintenance repair frequency for equipment.</p> <p>Determine method of calibration and determine if equipment can be calibrated.</p> <p>Determine known continuous problems (operating or maintenance) with the equipment.</p> <p>Take photographs of equipment to illustrate problem areas.</p>	
AZ.11.1.1.1	<i>Gamma Probe Well Structure</i>		"Cover plate is not sealed and water accumulates in well from infiltration and condensation".
AZ.11.1.1.2	<i>Gamma Probe & Well Cable</i>		"Coaxial cable is subject to failure from excessive moisture".
AZ.11.1.1.3	<i>Field Signal Cable</i>		"Coaxial cable is subject to failure from excessive moisture".
AZ.11.1.1.4	<i>reserved</i>		
AZ.11.1.1.5	<i>Count Rate Meters/ Alarm Comparators.</i>		<p>"Estimated age of equipment: 15 years".</p> <p>"Equipment is removed for shop calibration at 6 month intervals".</p>
AZ.11.1.2	Weight Factor & Specific Gravity Monitoring Subsystem	<p>Inspect instrument cables where accessible.</p> <p>Inspect wiring where accessible.</p> <p>Inspect instrument tubing where accessible.</p> <p>Inspect instrument and cabinets/terminal boxes for corrosion.</p> <p>Estimate age of equipment.</p> <p>Estimate maintenance repair frequency for equipment.</p> <p>Determine method of calibration and determine if equipment can be calibrated.</p> <p>Determine known continuous problems (operating or maintenance) with the equipment.</p> <p>Take photographs of equipment to illustrate problem areas.</p>	"The instrument air supply supplies wet, dirty, air".
AZ.11.1.2.1	<i>Sample Tubes (Leak Det. Pit)</i>		"Good condition".
AZ.11.1.2.2	<i>Weight Factor & Specific Gravity Pressure Sensors</i>		<p>"Estimated age of equipment is 15 years".</p> <p>"Appear to be in good condition".</p>

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS			
REF. NO.	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AZ.11	LEAK CONTROL SYSTEM		
AZ.11.1	LEAK DET. PTI/SUMP INST.		
AZ.11.1.1.1	Gamma Radiation Monitoring Subsystem	Inspect instrument cables where accessible. Inspect wiring where accessible. Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	
AZ.11.1.1.1	Gamma Probe Well Structure		"Cover plate is not sealed and water accumulates in well from infiltration and condensation".
AZ.11.1.1.2	Gamma Probe & Well Cable		"Coaxial cable is subject to failure from excessive moisture".
AZ.11.1.1.3	Field Signal Cable		"Coaxial cable is subject to failure from excessive moisture".
AZ.11.1.2.3	Weight Factor Cabinet		"Cabinet doors do not seal properly allowing dirt to infiltrate the cabinet". "Climate control not very effective - resistance heater which sometimes does not work in winter, no cooling capacity for summertime heat".
AZ.11.1.2.4	Field Tubing		"Tubing is routed in buried tubing from remote cabinets to 801 bldg". "Tubing appears to be in good condition but has been filled with water and debris from condensation of the instrument air system".
AZ.11.1.2.5	W.F. & SpG Pressure Switches & Indicators (Inst. Panel & Press. SW Rack)		"Estimated age of equipment is 15 years". "Low repair rate". "Calibration on annual rotation, performed in the field at 1 hour per instrument". "No recurrent problems". "Equipment difficult to access".
AZ.11.1.3	Liquid Presence Sensor and Buried wiring	Inspect wiring where accessible. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Equipment not available for inspection".

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS			
REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AZ.11	LEAK CONTROL SYSTEM		
AZ.11.1	LEAK DET. PIT/SUMP INST.		
AZ.11.1.1	Gamma Radiation Monitoring Subsystem	Inspect instrument cables where accessible. Inspect wiring where accessible. Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	
AZ.11.1.1.1	Gamma Probe Well Structure		"Cover plate is not sealed and water accumulates in well from infiltration and condensation".
AZ.11.1.1.2	Gamma Probe & Well Cable		"Coaxial cable is subject to failure from excessive moisture".
AZ.11.1.1.3	Field Signal Cable		"Coaxial cable is subject to failure from excessive moisture".
AZ.11.1.4	Liquid Temperature Sensor	Inspect wiring where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Take photographs of equipment to illustrate problem areas.	
AZ.11.2	ANNULUS LEAK INSTRUMENTATION		"Leak detection is provided by two separate systems: 1) Continuous air monitor 2) Continuity probe".
AZ.11.2.1	Annulus CAM Radiation Monitoring Subsystem	Inspect instrument cables where accessible. Inspect wiring where accessible. Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS				FINDINGS/COMMENTS
REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION		
AZ.11	LEAK CONTROL SYSTEM			
AZ.11.1	LEAK DET. PIT/SUMP INST.			
AZ.11.1.1	Gamma Radiation Monitoring Subsystem	Inspect instrument cables where accessible. Inspect wiring where accessible. Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.		
AZ.11.1.1.1	Gamma Probe Well Structure			"Cover plate is not sealed and water accumulates in well from infiltration and condensation".
AZ.11.1.1.2	Gamma Probe & Well Cable			"Coaxial cable is subject to failure from excessive moisture".
AZ.11.1.1.3	Field Signal Cable			"Coaxial cable is subject to failure from excessive moisture".
AZ.11.2.1.1	Air Sampler Probe/ Tubing/ etc			"Stainless Steel tubing in good condition".
AZ.11.2.1.2	Radiation Analyzer			"Estimated age of equipment is 15 years". "Low repair rate". "Calibration is on an annual rotation, performed in the shop at 8 hours per instrument." "CAM unit is in excess of 160 lbs and is hand moved to transport to the shop for calibration".
AZ.11.2.1.3	Cabinet s			"Doors do not fit properly allowing dust infiltration". "Poor climate control - hot in summer and cold in winter".
AZ.11.2.1.4	Recorder & Alarms			"Estimated age of equipment is 15 years". "Alarms are relayed off of field sensor". "High maintenance required to keep recorders serviceable".
AZ.11.2.1.5	Signal Wiring/ Conduit			"Signal wiring is in good condition but is not well marked or documented for tracing".

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS				
REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS	
AZ.II	LEAK CONTROL SYSTEM			
AZ.II.1	LEAK DET. PIT/SUMP INST.			
AZ.II.1.1	Gamma Radiation Monitoring Subsystem	Inspect instrument cables where accessible. Inspect wiring where accessible. Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.		
AZ.II.1.1.1	<i>Gamma Probe Well Structure</i>		"Cover plate is not sealed and water accumulates in well from infiltration and condensation".	
AZ.II.1.1.2	<i>Gamma Probe & Well Cable</i>		"Coaxial cable is subject to failure from excessive moisture".	
AZ.II.1.1.3	<i>Field Signal Cable</i>		"Coaxial cable is subject to failure from excessive moisture".	
AZ.II.2.2	Annulus Liquid Presence Sensor (Flake Box & Manual Tape Conductivity Probe)	Inspect wiring where accessible. Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Out of service".	
AZ.II.2.3	Annulus Pump Pit Liquid Presence Sensor	See AZ.II.3.3	"Continuity probe". "Function check monthly at 1/2 hour per instrument".	
AZ.II.3	PIPELINE LEAK INSTRUMENTATION			
AZ.II.3.1	C.O.B. Liquid Presence Sensor	See AZ.II.3.3	"Estimated age 15 years". "No Calibration - Function tests performed monthly or bimonthly".	
AZ.II.3.2	Pipeline Pressure Switch Sensor	See AZ.II.3.3		

EXISTING TANK FARM EQUIPMENT
FIELD ASSESSMENT TABLE
INSTRUMENTS & CONTROL SYSTEMS

REF. NO.	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AZ.11	LEAK CONTROL SYSTEM		
AZ.11.1	LEAK DET. PIT/SUMP INST.		
AZ.11.1.1	Gamma Radiation Monitoring Subsystem	<p>Inspect instrument cables where accessible.</p> <p>Inspect wiring where accessible.</p> <p>Inspect instrument tubing where accessible.</p> <p>Inspect equipment and cabinets/terminal boxes for corrosion.</p> <p>Estimate age of equipment.</p> <p>Estimate maintenance repair frequency for equipment.</p> <p>Determine method of calibration and determine if equipment can be calibrated.</p> <p>Determine known continuous problems (operating or maintenance) with the equipment.</p> <p>Take photographs of equipment to illustrate problem areas.</p>	
AZ.11.1.1.1	<i>Gamma Probe Well Structure</i>		"Cover plate is not sealed and water accumulates in well from infiltration and condensation".
AZ.11.1.1.2	<i>Gamma Probe & Well Cable</i>		"Coaxial cable is subject to failure from excessive moisture".
AZ.11.1.1.3	<i>Field Signal Cable</i>		"Coaxial cable is subject to failure from excessive moisture".
AZ.11.3.3	Transfer Pit Instruments (LDE only)	<p>Inspect wiring where accessible.</p> <p>Inspect equipment and cabinets/terminal boxes for corrosion.</p> <p>Estimate age of equipment.</p> <p>Estimate maintenance repair frequency for equipment.</p> <p>Determine method of calibration and determine if equipment can be calibrated.</p> <p>Determine known continuous problems (operating or maintenance) with the equipment.</p> <p>Take photographs of equipment to illustrate problem areas.</p>	
AZ.11.3.3.1	<i>Pit Liquid Presence Sensor</i>		"No access to sensor".
AZ.11.3.3.2	<i>reserved</i>		
AZ.11.3.3.3	<i>Pit Signal Wiring/Conduit/TBX</i>		"Good condition".
AZ.11.3.4	Field Signal Wiring/ Conduit/ Terminal Boxes		<p>"Estimated age of equipment 20 years".</p> <p>"The weather tight integrity of terminal boxes is poor. Terminals are subject to fouling from dust and humidity".</p>
AZ.11.3.5	Encasement Leak Detection Pit Instruments (AZ farm only)	See AZ.11.3.3	<p>"Monthly PM 1/2 hour per instrument".</p> <p>"No calibration possible".</p>

EXISTING TANK FARM EQUIPMENT
FIELD ASSESSMENT TABLE
INSTRUMENTS & CONTROL SYSTEMS

REF. NO.	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AZ.11	LEAK CONTROL SYSTEM		
AZ.11.1	LEAK DET. PIT/SUMP INST.		
AZ.11.1.1	Gamma Radiation Monitoring Subsystem	Inspect instrument cables where accessible. Inspect wiring where accessible. Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	
AZ.11.1.1.1	Gamma Probe Well Structure		"Cover plate is not sealed and water accumulates in well from infiltration and condensation"
AZ.11.1.1.2	Gamma Probe & Well Cable		"Coaxial cable is subject to failure from excessive moisture"
AZ.11.1.1.3	Field Signal Cable		"Coaxial cable is subject to failure from excessive moisture"
AZ.11.4	PUMP PERMISSIVE INSTRUMENTATION (Master Pump shutdown)		
AZ.11.4.1	Master Pump Shutdown Relay Panel	Inspect instrument cables where accessible. Inspect wiring where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Wiring is in good condition within relay panel". "Estimated age of equipment is 20 years". "Maintenance history unknown". "Prints need to be updated for better reliability of maintenance".
AZ.11.4.2	MPS Pushbutton Control Panel		
AZ.11.4.3	Signal Wiring/Conduit/TBX		"Wiring is in good condition"

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS			
REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AZ.11	LEAK CONTROL SYSTEM		
AZ.11.1	LEAK DET. PIT/SUMP INST.		
AZ.11.1.1	Gamma Radiation Monitoring Subsystem	<p>Inspect instrument cables where accessible. Inspect wiring where accessible. Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.</p>	
AZ.11.1.1.1	<i>Gamma Probe Well Structure</i>		"Cover plate is not sealed and water accumulates in well from infiltration and condensation".
AZ.11.1.1.2	<i>Gamma Probe & Well Cable</i>		"Coaxial cable is subject to failure from excessive moisture".
AZ.11.1.1.3	<i>Field Signal Cable</i>		"Coaxial cable is subject to failure from excessive moisture".
AZ.11.4.4	[242-A Relay Panel]	<p>Inspect instrument cables where accessible. Inspect wiring where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.</p>	"Good condition".
AZ.11.5	LOCAL ALARM ANNUNCIATION PANELS	<p>Inspect instrument cables where accessible. Inspect wiring where accessible. Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.</p>	

**EXISTING TANK FARM EQUIPMENT
FIELD ASSESSMENT TABLE
INSTRUMENTS & CONTROL SYSTEMS**

REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AZ.11	LEAK CONTROL SYSTEM		
AZ.11.1	LEAK DET. PIT/SUMP INST.		
AZ.11.1.1	Gamma Radiation Monitoring Subsystem	<p>Inspect instrument cables where accessible.</p> <p>Inspect wiring where accessible.</p> <p>Inspect instrument tubing where accessible.</p> <p>Inspect equipment and cabinets/terminal boxes for corrosion.</p> <p>Estimate age of equipment.</p> <p>Estimate maintenance repair frequency for equipment.</p> <p>Determine method of calibration and determine if equipment can be calibrated.</p> <p>Determine known continuous problems (operating or maintenance) with the equipment.</p> <p>Take photographs of equipment to illustrate problem areas.</p>	
AZ.11.1.1.1	<i>Gamma Probe Well Structure</i>		"Cover plate is not sealed and water accumulates in well from infiltration and condensation".
AZ.11.1.1.2	<i>Gamma Probe & Well Cable</i>		"Coaxial cable is subject to failure from excessive moisture".
AZ.11.1.1.3	<i>Field Signal Cable</i>		"Coaxial cable is subject to failure from excessive moisture".
AZ.11.5.1	241-A-271 Alarm Panel		"Good condition". "Estimated age of equipment 20 years".
AZ.11.5.2	241-AZ-801 Alarm Panel		"Good condition".
AZ.11.5.3	CASS Alarm Panel Interface		
AZ.11.6	REMOTE ALARM SIGNALING (GAMEWELL LOOP)		"Removed from service".
AZ.11.7	TANK WASTE HIGH LEVEL ALARM SUBSYSTEM	<p>Inspect wiring where accessible.</p> <p>Inspect equipment and cabinets/terminal boxes for corrosion.</p> <p>Estimate age of equipment.</p> <p>Estimate maintenance repair frequency for equipment.</p> <p>Determine method of calibration and determine if equipment can be calibrated.</p> <p>Determine known continuous problems (operating or maintenance) with the equipment.</p> <p>Take photographs of equipment to illustrate problem areas.</p>	
AZ.11.7.1	Waste Liquid High Level Probe		"No maintenance being performed".

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS			
REF. NO.	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AZ.11	LEAK CONTROL SYSTEM		
AZ.11.1	LEAK DET. PT./SUMP INST.		
AZ.11.1.1	Gamma Radiation Monitoring Subsystem	<p>Inspect instrument cables where accessible. Inspect wiring where accessible. Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.</p>	
AZ.11.1.1.1	<i>Gamma Probe Well Structure</i>		"Cover plate is not sealed and water accumulates in well from infiltration and condensation".
AZ.11.1.1.2	<i>Gamma Probe & Well Cable</i>		"Coaxial cable is subject to failure from excessive moisture".
AZ.11.1.1.3	<i>Field Signal Cable</i>		"Coaxial cable is subject to failure from excessive moisture".
AZ.11.7.2	Tank Farm Alarm Panels		"Good condition".
AZ.11.7.3	Signal Wiring/Conduit/TBX		"Good condition". "Estimated age of equipment 20 years".
AZ.12	VENTILATION CONTROL SYSTEM		
AZ.12.1	TANK PRIMARY VENTILATION SYSTEM		
AZ.12.1.1	Tank Diff. Pressure Inst. Subsystem	<p>Inspect wiring where accessible. Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.</p>	"Estimated age of equipment 20 years".

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS				FINDINGS/COMMENTS
REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION		
AZ.11	LEAK CONTROL SYSTEM			
AZ.11.1	LEAK DET. PT/SUMP INST.			
AZ.11.1.1	Gamma Radiation Monitoring Subsystem	<p>Inspect instrument cables where accessible.</p> <p>Inspect wiring where accessible.</p> <p>Inspect instrument tubing where accessible.</p> <p>Inspect equipment and cabinets/terminal boxes for corrosion.</p> <p>Estimate age of equipment.</p> <p>Estimate maintenance repair frequency for equipment.</p> <p>Determine method of calibration and determine if equipment can be calibrated.</p> <p>Determine known continuous problems (operating or maintenance) with the equipment.</p> <p>Take photographs of equipment to illustrate problem areas.</p>		
AZ.11.1.1.1	Gamma Probe Well Structure			"Cover plate is not sealed and water accumulates in well from infiltration and condensation".
AZ.11.1.1.2	Gamma Probe & Well Cable			"Coaxial cable is subject to failure from excessive moisture".
AZ.11.1.1.3	Field Signal Cable			"Coaxial cable is subject to failure from excessive moisture".
AZ.12.1.1.1	Tank Riser Tubing to Pressure Sensor/Transmitter			"Good condition".
AZ.12.1.1.2	Pressure Sensor/Transmitter			"No remote readout capability".
AZ.12.1.1.3	Field Instrument Air Tubing			"Black poly tubing not conducive to proper maintenance".
AZ.12.1.1.4	Pressure Switch/Alarm			<p>"Estimated age of equipment is 20 years".</p> <p>"Low repair rate".</p> <p>"Calibration on annual rotation. Performed in the field at 1 hour per instrument".</p>
AZ.12.1.1.5	Pressure Recorder			<p>"Estimated age of equipment is 20 years".</p> <p>"Requires frequent maintenance".</p>

**EXISTING TANK FARM EQUIPMENT
FIELD ASSESSMENT TABLE**
INSTRUMENTS & CONTROL SYSTEMS

REF. NO.	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AZ.11	LEAK CONTROL SYSTEM		
AZ.11.1	LEAK DET., PIT/SUMP INST.		
AZ.11.1.1	Gamma Radiation Monitoring Subsystem	<p>Inspect instrument cables where accessible.</p> <p>Inspect wiring where accessible.</p> <p>Inspect instrument tubing where accessible.</p> <p>Inspect equipment and cabinets/terminal boxes for corrosion.</p> <p>Estimate age of equipment.</p> <p>Estimate maintenance repair frequency for equipment.</p> <p>Determine method of calibration and determine if equipment can be calibrated.</p> <p>Determine known continuous problems (operating or maintenance) with the equipment.</p> <p>Take photographs of equipment to illustrate problem areas.</p>	
AZ.11.1.1.1	<i>Gamma Probe Well Structure</i>		"Cover plate is not sealed and water accumulates in well from infiltration and condensation".
AZ.11.1.1.2	<i>Gamma Probe & Well Cable</i>		"Coaxial cable is subject to failure from excessive moisture".
AZ.11.1.1.3	<i>Field Signal Cable</i>		"Coaxial cable is subject to failure from excessive moisture".
AZ.12.1.2	HEPA Filter Diff. Pressure Instr.	<p>Inspect wiring where accessible.</p> <p>Inspect instrument tubing where accessible.</p> <p>Estimate age of equipment.</p> <p>Inspect equipment and cabinets/terminal boxes for corrosion.</p> <p>Estimate maintenance repair frequency for equipment.</p> <p>Determine method of calibration and determine if equipment can be calibrated.</p> <p>Determine known continuous problems (operating or maintenance) with the equipment.</p> <p>Take photographs of equipment to illustrate problem areas.</p>	<p>"Estimated age of equipment is 20 years".</p> <p>"Gauges are replaced frequently (2-3 years)".</p> <p>"Calibration performed annually in the field at 30 minutes per instrument".</p>
AZ.12.1.3	Temperature Instrumentation		"Estimated age of equipment is 20 years". "Frequent maintenance".
AZ.12.1.4	Heater Control Subsystem	<p>Inspect wiring where accessible.</p> <p>Inspect equipment and cabinets/terminal boxes for corrosion.</p> <p>Estimate age of equipment.</p> <p>Estimate maintenance repair frequency for equipment.</p> <p>Determine method of calibration and determine if equipment can be calibrated.</p> <p>Determine known continuous problems (operating or maintenance) with the equipment.</p> <p>Take photographs of equipment to illustrate problem areas.</p>	<p>"Estimated age of equipment is 20 years".</p> <p>"Frequent maintenance".</p> <p>"6 month calibration rotation 1 hour per calibration".</p>

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS				FINDINGS/COMMENTS
REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION		
AZ.11	LEAK CONTROL SYSTEM			
AZ.11.1	LEAK DET. PIT/SUMP INST.			
AZ.11.1.1	Gamma Radiation Monitoring Subsystem	Inspect instrument cables where accessible. Inspect wiring where accessible. Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.		
AZ.11.1.1.1	Gamma Probe Well Structure		"Cover plate is not sealed and water accumulates in well from infiltration and condensation".	
AZ.11.1.1.2	Gamma Probe & Well Cable		"Coaxial cable is subject to failure from excessive moisture".	
AZ.11.1.1.3	Field Signal Cable		"Coaxial cable is subject to failure from excessive moisture".	
AZ.12.1.5	Fan-Motor Control Subsystem		"Fan speed adjusted manually".	
AZ.12.1.6	Damper Control Subsystem		"Dampers adjusted manually".	
AZ.12.1.8	Regulated Stack Monitoring System ()	Inspect instrument cables where accessible. Inspect wiring where accessible. Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.		
AZ.12.1.8.1	Tubing from Stack to CAM		"Seamless good condition".	
AZ.12.1.8.2	CAMs Radiation Analyzers		"CAM is calibrated yearly in shop at 8 hours per instrument". "CAM weighs in excess of 160 pounds and are hard to access for removal from the cabinets for maintenance or calibration". "Low repair rate".	

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS			
REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AZ.11	LEAK CONTROL SYSTEM		
AZ.11.1	LEAK DET. PIT/SUMP INST.		
AZ.11.1.1	Gamma Radiation Monitoring Subsystem	Inspect instrument cables where accessible. Inspect wiring where accessible. Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	
AZ.11.1.1.1	Gamma Probe Well Structure		"Cover plate is not sealed and water accumulates in well from infiltration and condensation"
AZ.11.1.1.2	Gamma Probe & Well Cable		"Coaxial cable is subject to failure from excessive moisture"
AZ.11.1.1.3	Field Signal Cable		"Coaxial cable is subject to failure from excessive moisture"
AZ.12.1.8.3	CAM Cabinets		"Cabinet doors do not seal properly allowing dirt to infiltrate the cabinet". "Climate control is not very effective - resistance heater which sometimes does not work in winter, no cooling capacity for summertime heat"
AZ.12.1.8.4	Vacuum Pumps		"Estimated age of equipment is 15 years". "Estimated life of pump 2 - 3 year". "Functional test only". "No known recurrent problems"
AZ.12.1.8.5	Recorder (242-A)		"Wiring showing signs of wear and aging"
AZ.12.2	TANK ANNULUS VENTILATION SYSTEM		
AZ.12.2.1	Annulus Diff. Pressure Subsystem	Inspect instrument tubing where accessible. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS			
REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AZ.11	LEAK CONTROL SYSTEM		
AZ.11.1	LEAK DET. PIT/SUMP INST.		
AZ.11.1.1	Gamma Radiation Monitoring Subsystem	<p>Inspect instrument cables where accessible.</p> <p>Inspect wiring where accessible.</p> <p>Inspect instrument tubing where accessible.</p> <p>Inspect equipment and cabinets/terminal boxes for corrosion.</p> <p>Estimate age of equipment.</p> <p>Estimate maintenance repair frequency for equipment.</p> <p>Determine method of calibration and determine if equipment can be calibrated.</p> <p>Determine known continuous problems (operating or maintenance) with the equipment.</p> <p>Take photographs of equipment to illustrate problem areas.</p>	
AZ.11.1.1.1	<i>Gamma Probe Well Structure</i>		"Cover plate is not sealed and water accumulates in well from infiltration and condensation".
AZ.11.1.1.2	<i>Gamma Probe & Well Cable</i>		"Coaxial cable is subject to failure from excessive moisture".
AZ.11.1.1.3	<i>Field Signal Cable</i>		"Coaxial cable is subject to failure from excessive moisture".
AZ.13	TRANSFER LINE CONTROL SYSTEM		
AZ.13.1	PUMP CONTROL SUBSYSTEM	<p>Inspect wiring where accessible.</p> <p>Inspect equipment and cabinets/terminal boxes for corrosion.</p> <p>Estimate age of equipment.</p> <p>Estimate maintenance repair frequency for equipment.</p> <p>Determine known continuous problems (operating or maintenance) with the equipment.</p> <p>Take photographs of equipment to illustrate problem areas.</p>	"Estimated age of equipment 20 years".
AZ.13.2	VALVE POSITION INSTRUMENTATION/ INDICATION		"Maintenance not performed on this equipment".
AZ.13.3	VALVE CONTROL SYSTEM		"Valves manually operated".
AZ.13.4	PRESSURE SWITCH INSTRUMENTATION (Flow Indication)		

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS			
REF. NO.	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AZ.11	LEAK CONTROL SYSTEM		
AZ.11.1	LEAK DET. PIT/SUMP INST.		
AZ.11.1.1	Gamma Radiation Monitoring Subsystem	<p>Inspect instrument cables where accessible.</p> <p>Inspect wiring where accessible.</p> <p>Inspect instrument tubing where accessible.</p> <p>Inspect equipment and cabinets/terminal boxes for corrosion.</p> <p>Estimate age of equipment.</p> <p>Estimate maintenance repair frequency for equipment.</p> <p>Determine method of calibration and determine if equipment can be calibrated.</p> <p>Determine known continuous problems (operating or maintenance) with the equipment.</p> <p>Take photographs of equipment to illustrate problem areas.</p>	
AZ.11.1.1.1	<i>Gamma Probe Well Structure</i>		"Cover plate is not sealed and water accumulates in well from infiltration and condensation".
AZ.11.1.1.2	<i>Gamma Probe & Well Cable</i>		"Coaxial cable is subject to failure from excessive moisture".
AZ.11.1.1.3	<i>Field Signal Cable</i>		"Coaxial cable is subject to failure from excessive moisture".
AZ.13.5	WASTE FLOW MONITORING INSTRUMENTATION (Service Pit & Flush Pit)	<p>Inspect instrument cables where accessible.</p> <p>Inspect wiring where accessible.</p> <p>Inspect equipment and cabinets/terminal boxes for corrosion.</p> <p>Estimate age of equipment.</p> <p>Estimate maintenance repair frequency for equipment.</p> <p>Determine method of calibration and determine if equipment can be calibrated.</p> <p>Determine known continuous problems (operating or maintenance) with the equipment.</p> <p>Take photographs of equipment to illustrate problem areas.</p>	
AZ.13.5.1	Service Pit Instrument Subsystems		"Estimated age of equipment 15 years".
AZ.13.5.1.1	<i>Flow Monitor & Totalizer</i>		"No known problems".
AZ.13.5.1.2	<i>Radiation (Gamma) Monitor</i>		"No known problems".
AZ.13.5.1.3	<i>Pipeline Pressure Sensor</i>		

**EXISTING TANK FARM EQUIPMENT
FIELD ASSESSMENT TABLE
INSTRUMENTS & CONTROL SYSTEMS**

REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AZ.11	LEAK CONTROL SYSTEM		
AZ.11.1	LEAK DET. PIT/SUMP INST.		
AZ.11.1.1	Gamma Radiation Monitoring Subsystem	<p>Inspect instrument cables where accessible.</p> <p>Inspect wiring where accessible.</p> <p>Inspect instrument tubing where accessible.</p> <p>Inspect equipment and cabinets/terminal boxes for corrosion.</p> <p>Estimate age of equipment.</p> <p>Estimate maintenance repair frequency for equipment.</p> <p>Determine method of calibration and determine if equipment can be calibrated.</p> <p>Determine known continuous problems (operating or maintenance) with the equipment.</p> <p>Take photographs of equipment to illustrate problem areas.</p>	
AZ.11.1.1.1	Gamma Probe Well Structure		"Cover plate is not sealed and water accumulates in well from infiltration and condensation".
AZ.11.1.1.2	Gamma Probe & Well Cable		"Coaxial cable is subject to failure from excessive moisture".
AZ.11.1.1.3	Field Signal Cable		"Coaxial cable is subject to failure from excessive moisture".
AZ.14	TANK CONTENTS MONITORING SYSTEM		
AZ.14.1	TEMPERATURE/VAPOR INSTRUMENTATION	<p>Inspect wiring where accessible.</p> <p>Inspect equipment and cabinets/terminal boxes for corrosion.</p> <p>Estimate age of equipment.</p> <p>Estimate maintenance repair frequency for equipment.</p> <p>Determine method of calibration and determine if equipment can be calibrated.</p> <p>Determine known continuous problems (operating or maintenance) with the equipment.</p> <p>Take photographs of equipment to illustrate problem areas.</p>	
AZ.14.1.1	Thermocouple Probes		<p>"Estimated age of equipment 20 years".</p> <p>"Numerous TC Probes have failed".</p>
AZ.14.3	CHEMICAL COMPOSITION MONITORING		

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS			
REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AZ.11	LEAK CONTROL SYSTEM		
AZ.11.1	LEAK DET. PIT/SUMP INST.		
AZ.11.1.1	Gamma Radiation Monitoring Subsystem	Inspect instrument cables where accessible. Inspect wiring where accessible. Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	
AZ.11.1.1.1	<i>Gamma Probe Well Structure</i>		"Cover plate is not sealed and water accumulates in well from infiltration and condensation".
AZ.11.1.1.2	<i>Gamma Probe & Well Cable</i>		"Coaxial cable is subject to failure from excessive moisture".
AZ.11.1.1.3	<i>Field Signal Cable</i>		"Coaxial cable is subject to failure from excessive moisture".
AZ.14.3.1	Weight Factor & Loop Seal Instrumentation		"Age of equipment estimated at 20 years". "Calibration performed yearly at 1 hour per instrument". "Equipment requires frequent repairs."
AZ.14.4	TANK LIQUID SURFACE LEVEL INSTRUMENTATION		
AZ.14.4.1	FIC/Enraf Riser Extension		"AZ Enraf installed Good Condition". "AY FIC installed - Monthly maintenance".
AZ.14.4.2	FIC/Enraf Level Sensor		"AY Enraf Good Condition". "AZ FIC estimated age 20 years".
AZ.14.4.4	reserved		
AZ.14.4.4	Signal Cables/Terminal Boxes		"Estimated age 20 years". "Terminal boxes not adequately weather tight".

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS			
REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AZ.11	LEAK CONTROL SYSTEM		
AZ.11.1	LEAK DET. PIT/SUMP INST.		
AZ.11.1.1	Gamma Radiation Monitoring Subsystem	<p>Inspect instrument cables where accessible. Inspect wiring where accessible. Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.</p>	
AZ.11.1.1.1	<i>Gamma Probe Well Structure</i>		"Cover plate is not sealed and water accumulates in well from infiltration and condensation".
AZ.11.1.1.2	<i>Gamma Probe & Well Cable</i>		"Coaxial cable is subject to failure from excessive moisture".
AZ.11.1.1.3	<i>Field Signal Cable</i>		"Coaxial cable is subject to failure from excessive moisture".
AZ.14.4.5	Email/CASS Digital Interface		"Estimated age 20 years".
AZ.14.5	SLUDGE WEIGHT (LEVEL) MONITORING	<p>Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.</p>	<p>"Failure rate 2-3 years". "Manual reading".</p>

EXISTING TANK FARM EQUIPMENT REQUIREMENTS ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS			
REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS DESCRIPTION	FINDINGS/COMMENTS
AZ.15	TANK CONTENTS MIXING & HEATING SYSTEMS		

AZ.15.1	AIR LIFT CIRCULATOR CONTROL SYSTEM	Inspect wiring where accessible. Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	"Out of Service"
AZ.15.1.1	Diff. Pressure Sensors		
AZ.15.1.2	Local Indication		
AZ.15.1.3	Flow Cutoff Valve		
AZ.15.1.4	Gamma Detectors Check Valve/Caisson (AZ only)		"Estimated age 15 years". "Maintenance frequency 1 month 1/2 hour per unit".
AZ.15.1.5	Count Rate Meters Check Valve Caisson (241-A-271 for AZ only)		"Estimated age 15 years". "Recurrent moisture problems".
AZ.15.3	STEAM HEAT CONTROL / INSTRUMENTATION		"Not assessed"
AZ.16	SCC STATUS/MONITORING SYSTEM	Inspect instrument cables where accessible. Inspect wiring where accessible. Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	
AZ.16.1	AC POWER SUPPLY STATUS INST.		
AZ.16.2	AIR SUPPLY STATUS INST.		"No indicator of air quality".
AZ.16.3	WATER SUPPLY STATUS INST.		"Local indication only".

AZ.16.4	TANK CONCRETE STRUCTURE TEMPERATURE INST.	Inspect instrument cables where accessible. Inspect wiring where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Determine maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	
AZ.16.4.1	Data Logger (See CASS Assessment)		"Out of Service".
AZ.16.4.2	Manual Readout Panel		
AZ.16.4.3	Signal Wiring/Terminal Boxes		
AZ.16.5	HEAT TRACE SYSTEM STATUS INST.		
AZ.16.6	CATHODIC PROTECTION SYSTEM STATUS INST.		
AZ.17	HEAT TRACE CONTROL SYSTEM	Inspect instrument cables where accessible. Inspect wiring where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Determine maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	
AZ.17.1	TEMPERATURE MONITORING SENSORS		"Estimated age of equipment 20 years".
AZ.17.2	TEMP. CONTROLLER SUBSYSTEM		"Maintenance performed yearly at 1 hour per unit".
AZ.17.3	OVER TEMP. CONTROLLER SUBSYSTEM		
AZ.17.4	HEATER CONTACTOR - OTHER WIRING		
AZ.17.5	PIPELINE HEAT TRACE TAPE HEATER		"Heat trace not maintained".

AZ.18	CATHODIC PROTECTION CONTROL SYSTEM	<p>Inspect instrument cables where accessible.</p> <p>Inspect wiring where accessible.</p> <p>Inspect equipment and cabinets/terminal boxes for corrosion.</p> <p>Estimate age of equipment.</p> <p>Determine maintenance repair frequency for equipment.</p> <p>Determine method of calibration and determine if equipment can be calibrated.</p> <p>Determine known continuous problems (operating or maintenance) with the equipment.</p> <p>Take photographs of equipment to illustrate problem areas.</p>	
AZ.18.1	POWER CONTROLLER		"Estimated age less than 5 years".
AZ.18.2	WIRING/CONDUIT/TBX		"Good Condition".

7.7 CAIS Data Sheets

241 AY/AZ INSTRUMENTATION NARRATIVE

EQUIPMENT DESCRIPTION

Instrumentation for leak monitoring is located in the tank annulus, pump pit, annulus pump pit, the clean out boxes, and the waste transfer piping. This equipment monitors for leaks originating at each respective location. The leak detection pit monitoring equipment detects gamma radiation in effluent originating from a breach in the inner and outer shells. Radiation monitoring instruments are installed on the ventilation stacks of the annulus exhausts. Ventilation instruments monitor and alarm a loss of ventilation to the annulus, loss of blast heaters at the primary, and high or low tank pressure. Primary ventilation system is currently being upgraded by project W-030. Waste level is monitored and alarmed using a ENRAF for tank 101 and a FIC for tank 102 farm and, which also includes a manual tape reel should the FIC/ENRAF fail.

SYSTEM CONDITION SUMMARY

REF NO 241AZ.I1.1 LEAK DETECTION PIT/SUMP INSTRUMENTATION

Leak detection pit well structure allows water to accumulate in the pit causing frequent probe failures. The instrument air supply is not currently monitored for air quality and it is reported by maintenance that dirt and moisture in the instrument air causes problems. The weight factor and specific gravity system cabinet is in poor condition exhibiting poor door seals and climate control.

REF NO 241AZ.I1.2 ANNULUS LEAK INSTRUMENTATION

The annulus radiation monitoring system is difficult to maintain due to the poor access to the CAMs. Most of the instrument cabinets and TBXs in the farm proper are in poor condition, allowing moisture and dirt to infiltrate the enclosures. The annulus liquid presence sensors (flake boxes) are currently out of service as is the CASS data logger. It is assumed that the on going construction efforts of project W-030 (primary ventilation systems upgrades) is the reasoning for these systems being out of service at this time.

Signal wire and terminations are in adequate condition, although the prints do not necessarily reflect the labeling in the field. The lack of print and labeling accuracy creates difficulty for the personnel to perform maintenance and repair actions. The pin recorders located in the instrument building (the same type of instruments used

in the other DST farms) are difficult to maintain, fail frequently, and only provide manual collection of data for trending purposes.

REF NO 241AZ.I2.1 TANK PRIMARY VENTILATION SYSTEM

Primary ventilation system was not inspected due to the on going construction efforts of project W-030 AY/AZ primary ventilation upgrade. Some observations and comments were made by the I & C technician that was interviewed concerning the existing primary ventilation system and include the following: Black poly tubing is used in some areas to supply instrument air. The pressure recorder is difficult to maintain and only provides for manual collection of data. Fan speed is adjusted manually by changing pulley diameter and the dampers are manually adjusted to obtain the required air flow.

REF NO 241AZ.I2.2 TANK ANNULUS VENTILATION SYSTEM

The AZ annulus exhaust system differential pressure gauges are replaced approximately every two to three years.

REF NO 241AZ.I4 TANK CONTENTS MONITORING SYSTEM

Maintenance has reported numerous thermocouple probe failures. Weight factor sample probes become plugged frequently, requiring maintenance to flush out the tubing. Poor quality instrument air also creates problems with this system. AZ farm is currently using ENRAF for tank 101 and FIC gauges for tank 102 to monitor tank waste level. The FIC's require frequent repair action because of sensor failure.

AZ farm is currently in disarray due to the construction efforts for project W-030.

The overall condition of AZ farms instrumentation is "fair" 5.

CONDITION ASSESSMENT INFORMATION SYSTEM

Report : RELATED SITE EQUIPMENT
Filename : RPTEQPT.lis
Run by : CAIS
Report Date : 29-NOV-95
Parameters Entered
Parent Equipment ID: %

29-NOV-95

CONDITION ASSESSMENT INFORMATION SYSTEM

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CAIS Special Report - RPT-005

Asset	Site Component	Name	Sys No.	System Name
Survey Component				
Survey Comment				

241AZ-0000	: WASTE DISPOSAL TANK FARM			
241AZ ANN DP	ANNULUS DIFF. PRESSURE SUBSYS			
241AZ K1 & K2-DPI-1 THRU 4	ANNULUS DIFF. PRESSURE		2.2.1	ANNULUS DIFF. PRESSURE SUBSYS
GAUGES ARE REPLACED FREQUENTLY 2TO3YRS.				
MINUTES PER INSTRUMENT.				
241AZ ANN LPS	ANNULUS LIQUID PRESENCE SENSOR			
241AZ LDE-101 & 102-A,B & C	ANNULUS LIQUID PRESENCE SENSOR		1.2.2	Liquid Presence Sensor (Flake P
Manu				
OUT OF SERVICE.				
241AZ ANN PPLPS	ANNULUS PUMP PIT L PRESENCE S			
241AZ LDE-101 & 102-4	ANNULUS PUMP PIT LPS		1.2.3	ANNULUS PUMP PIT LPS

CONTINUITY PROBE: FUNCTION CHECK MONTHLY
AT 1/2HR PER INST.

241AZ CAM RM	ANNULUS CAM RADIATION MONITOR	
241AZ EXH-K2-TUBING	AIR SAMPLER/TUBING/ECT	1.2.1.1 Air Sampler Probe/ Tubing/ etc
STAINLESS STEEL TUBING IS IN GOOD CONDITION.		
241AZ K2-CAM-101 & 102-AZ	RADIATION ANALYZER	1.2.1.2 Radiation Analyzer
CAMS HAVE A LOW REPAIR RATE. THEY ARE CALIBRATED ANNUALLY IN THE SHOP AT 8HRS PER INST. CAMS ARE IN EXCESS OF 100 POUNDS AND ARE REMOVED BY HAND TO BE TRANSPORTED TO THE SHOP.		
241AZ EXH-K2-CAB	CAM CABINETS	1.2.1.3 Cabinet (Vent. Pit)
DOORS DO NOT FIT PROPERLY ALLOWING DUST INFILTRATION. POOR CLIMATE CONTROL-HOT IN THE SUMMER COLD IN THE WINTER.		
241AZ WIRING/CONDUIT	SIGNAL WIRING/CONDUIT	1.2.1.5 Signal Wiring/ Conduit

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CONDITION ASSESSMENT INFORMATION SYSTEM

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CAIS Special Report - RPT-005

Asset	Site Component	Name	Sys No.	System Name
	Survey Component	Survey Comment		

241AZ-0000	: WASTE DISPOSAL TANK FARM			
		SIGNAL WIRING IS IN GOOD CONDITION, BUT IS NOT WELL MARKED OR DOCUMENTED FOR TRACING.		
	241AZ-801A	WFA-101 & 102-1	RECORDER & ALARMS	1.2.1.4 3-Pen recorder & Alarms
		HIGH MAINTENANCE REQUIRED TO KEEP RECORDERS SERVICEABLE. EST AGE OF EQUIP IS 15YRS. ALARMS ARE RELAYED OFF OF FIELD SENSORS.		
	241AZ CP CTRL SYS	CATHODIC PROTECTION CTRL SYS		
	241AZ RECTIFIER-45	POWER CONTROLLER	8.1	POWER CONTROLLER
		ESTIMATED AGE OF EQUIPMENT IS LESS THAN 5 YEARS.		
	241AZ WIRE	WIRING/TBX/CONDUIT	8.2	WIRING/TBX/CONDUIT
		THE WIRING/TBX/CONDUIT IS IN GOOD CONDITION.		

241AZ FIELD WIRE	FIELD SIGNAL WIRE/TBX/CONDUIT		
241AZ FIELD WIRING	FIELD SIGNAL WIRING/TBX/CONDUIT	1.3.4	FIELD SIGNAL WIRE/TBX/CONDUIT
EST AGE OF EQUIP IS 20YRS. THE WEATHER TIGHT INTEGRITY OF THE TERMINAL BOXES IS POOR. TERMINALS ARE SUBJECT TO FOULING FROM DUST AND HUMIDITY.			
241AZ HT CTRL SYS	HEAT TRACE CONTROL SYSTEM		
241AZ TEMP MON SENSORS	TEMPERATURE MONITORING SYSTEM	7.1	TEMPERATURE (T/C) MONITORING
ESTIMATED AGE OF EQUIPMENT IS 20YRS.			
241AZ TC-500 THRU 503	TEMP CONTROLLER SUBSYSTEM	7.2	TEMP. CONTROLLER SUBSYSTEM
MAINTENANCE PERFORMED ANNUALLY AT 1HR PER INSTRUMENT.			
241AZ PL HT	PIPELINE HEAT TRACE	7.5	PIPELINE HEAT TRACE TAPE HTR

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CONDITION ASSESSMENT INFORMATION SYSTEM

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CAIS Special Report - RPT-005

Asset

Site Component

Survey Component

Survey Comment

Name

Sys No.

System Name

241AZ-0000 : WASTE DISPOSAL TANK FARM

HEAT TRACE IS NOT MAINTAINED.

241AZ P CTRL SYS

PUMP CONTROL SUBSYSTEM

241AZ PUMP

PUMP CONTROL SUBSYSTEM

3.1 PUMP CONTROL SYSTEM

ESTIMATED AGE OF EQUIPMENT IS 20YRS.

241AZ TK CM&HS

TK CONTENTS MIXING & HEATING S

241AZ ALC

AIR LIFT CIRCULATOR CONTROL S

5.1 AIR LIFT CIRCULATOR CONTROL SYSTEM

INSTRUMENT IS OUT OF SERVICE.

241AZ RE-AZ-161

GAMMA DETECTOR CK V. CAISSON

5.1.4 GAMMA DETECTOR CK. V. CAISSON

ESTIMATED AGE OF EQUIPMENT IS 15YRS. MAI

N TENANCE FREQUENCY 1 MONTH AT 1/2 HOUR P

ER INSTRUMENT.

241AZ RAIS-AZ-161

COUNT RATE METER CK V CAISSON 5.1.5 COUNT RATE METER CK V CAISSON

INSTRUMENT HAS RECURRENT MOISTURE PROBLE
MS. ESTIMATED AGE OF EQUIPMENT IS 15YRS.

241AZ PRI FAN CTRL

PRIMARY VENT FAN MOTOR CONTROL

241AZ MCC-241-AZ

FAN MOTOR CONTROL

2.1.5 Pressure Recorder (241-AW-271)

FAN SPEED ADJUSTED MANUALLY.

241AZ WST FM

WASTE FLOW MONITOR

241AZ SER PIT I

SERVICE PIT INSTRUMENT

3.5.1 SERVICE PIT INSTRUMENT

ESTIMATED AGE OF EQUIPMENT IS 15YRS.2

241AZ FM

FLOW MONITOR & TOTALIZER

3.5.1.1 FLOW MONITOR & TOTALIZER

29-NOV-95

CONDITION ASSESSMENT INFORMATION SYSTEM

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CAIS Special Report - RPT-005

Asset

Site Component

Survey Component

Survey Comment

Name

Sys No.

System Name

241AZ-0000 : WASTE DISPOSAL TANK FARM

NO KNOWN PROBLEMS.

241AZ RAD M

RADIATION GAMMA MONITOR

3.5.1.2 RADIATION (GAMMA) MONITOR

NO KNOWN PROBLEMS.

241AZ VALVE POSITION/CTRL

VALVE POSITION INST

241AZ V POS

VALVE POSITION INSTRUMENT

3.2 VALVE POSITION INSTRUMENTATION/ INDICATI

MAINTENANCE NOT PERFORMED ON THIS EQUIPM
ENT.

241AZ V CTRL

VALVE CONTROL SYSTEM

3.3 VALVE CONTROL SYSTEM

VALVES MANUALLY OPERATED.

241AZ TWHLA

TANK WASTE HIGH LEVEL ALARM

7.7-10

241AZ LLE-101 & 102-1 WASTE LIQUID HIGH LEVEL PROBE 1.7.1 Alarm Panel (241-AW-271)

MAINTENANCE IS NOT BEING PERFORMED

241AZ TKF PNLS TANK FARM ALARM PANELS 1.7.2 Alarm Panel CASS Interface

GOOD CONDITION.

241AZ SWTC SIGNAL WIRING/TBX/CONDUIT 1.7.3 Farm Alarm Panel

SIGNAL WIRING/TBX/CONDUIT IS IN GOOD CON
DITION. EST AGE OF EQUIP IS 20YRS.

241AZ TPI TRANSFER PIT INSTRUMENT

241AZ PIT WIRING TRANS PIT SIG/WIRING/TBX/CONDU 1.3.3.3 TRANSFER PIT SIGNAL WIRING/TBX

PIT SIGNAL WIRING/TBX/CONDUIT ARE IN GOO
D CONDITION.

241AZ TK LSL TANK LIQUID SURFACE LEVEL INST .

CAIS Special Report - RPT-005

Asset	Site Component	Name	Sys No.	System Name

241AZ-0000	: WASTE DISPOSAL TANK FARM			
241AZ	LLI-101 & 102-AZ	FIC/ENRAF RISER EXTENSION	4.4.1	FIC/ENRAF RISER EXTENSION
AZ TANK 101 ENRAF INSTALLED AN IN GOOD C ONDITION. AZ TANK 102 FIC EST AGE IS 20Y RS.				
241AZ	LLE-101 & 102-AZ	FIC/ENRAF LEVEL SENSOR	4.4.2	FIC/ENRAF LEVEL SENSOR
AZ TANK 101 ENRAF IS IN GOOD CONDITION.				
241AZ	W/T/C	SIGNAL WIRING/TBX/CONDUIT	4.4.4	SIGNAL WIRING/TBX/CONDUIT
TERMINAL BOXES ARE NOT ADEQUATELY WEATHE R TIGHT. FOR TANK 102 FIC. EST AGE IS 20 YRS.				
241AZ	SLE-101 & 102-1 THRU 7	SLUDGE WEIGHT MONITORING	4.5	SLUDGE WEIGHT (LEVEL) MONITORING
FAILURE RATE IS 2 TO 3 YRS. MANUAL READI NG.				
241AZ	TK CST	TK CONC STRUCTURE TEMPERATURE		

241AZ DATA LOG DATA LOGGER 6.4.1 DATA LOGGER

INSTRUMENT IS OUT OF SERVICE.

241AZ TK CONTENTS M TANK CONTENTS MONITORING

241AZ TE-101 & 102-PROBES THERMOCOUPLE PROBES 4.1.1 THERMOCOUPLE PROBES

NURMEROUS TC PROBES HAVE FAILED. EST AGE
OF EQUIP IS 20YRS.

241AZ LPS LIQUID PRESENCE SENSOR & WIRE

241AZ LDE-5 & 10 LIQUID PRESENCE SENSOR 1.1.3 Liquid Presence Sensor and Buried wiring
EQUIPMENT NOT AVAILABLE FOR INSPECTION.

241AZ GAMMA RM GAMMA RAD MONITORING SUBSYSTEM

7.7-14

241AZ CCM	CHEMICAL COMPOSITION MONITOR	
241AZ WF LOOP	WF LOOP SEAL INST	4.3.1 WEIGHT FACTOR LOOP SEAL
EQUIPMENT REQUIRES FREQUENT REPAIRS. EST AGE OF EQUIP IS 20YRS. CALIBRATED ANNUA LLY AT 1HR PER INST.		
241AZ C.O.B. LPS	C.O.B. LIQUID PRESENCE SENSOR	
241AZ LDE-COB	COB LIQUID PRESENCE SENSOR	1.3.1 C.O.B. LIQUID PRESENCE SENSOR
EST AGE OF EQUIP IS 15YRS. FUNCTIONAL TE STED MONTHLY OR BIMONTHLY, NOT CALIBRATE D.		
241AZ801-0000	: EP BUILDING	
241AZ AIR SS INST	AIR SUPPLY STATUS INSTRUMENT	

CONDITION ASSESSMENT INFORMATION SYSTEM

29-NOV-95

CAIS Special Report - RPT-005

Asset	Site Component	Name	Sys No.	System Name
	Survey Component			
	Survey Comment			

241AZ801-0000	: EP BUILDING			
241AZ-801	AIR SS INST	AIR SUPPLY STATUS INSTRUMENT	6.2	AIR SUPPLY STATUS INST.
AIR QUALITY IS NOT MONITORED.				
241AZ REG STK MON	REGULATED STACK MONITOR			
241AZ CAM TUBE	CAM TUBING			
STAINLESS STEEL TUBING IS GOOD CONDITION				
241AZ FI-CAM-K1 & K2	CAM'S			
CAM'S ARE CALIBRATED ANNUALLY IN THE SHOP AT 8HRS PER INST. CAM'S WEIGH IN EXCESS OF 100 POUNDS AND ARE HARD TO REMOVE CABINETS FOR MAINTENANCE OR CALIBRATION. LOW REPAIR RATE.				
241AZ VP	VACUUM PUMPS			
2.1.8.4 REG STACK MONITOR VACUUM PUMP				
EST LIFE OF PUMPS IS 2-3YRS. FUNCTIONALL				

Y TESTED ONLY. NO RECURRENT PROBLEMS.

241AZ RECORDER 242-A RECORDER 242-A 2.1.8.5 RECORDER 242-A

EQUIP WAS NOT INSPECTED

241AZ-801 WSS WATER SUPPLY STATUS INST.

241AZ PI-801-A6&A7 WATER SUPPLY STATUS INSTRUMENT 6.3 WATER SUPPLY STATUS INST.

LOCAL INDICATION ONLY.

241AZ-801 MPSPR MASTER PUMP SHUTDOWN RELAY

241AZ 241AZ-801-CAB MASTER PUMP SHUTDOWN RELAY PNL 1.4.1 MASTER PUMP SHUTDOWN RELAY PNL

WIRING IS IN GOOD CONDITION WITHIN THE R
ELAY PANEL. EST AGE OF EQUIP IS 20YRS. M
AINTENANCE HISTORY IS UNKNOWN. PRINTS NE
ED TO BE UPDATED FOR BETTER RELIABILITY
OF MAINTENANCE.

CAIS Special Report - RPT-005

Asset	Site Component	Name	Sys No.	System Name

241AZ801-0000 : EP BUILDING				
241AZ WIRING		SIGNAL WIRING/TBX/CONDUIT	1.4.3	SIGNAL WIRING/TBX/CONDUIT
SIGNAL WIRING/TBX/CONDUIT THAT WAS INSPECTED IS IN GOOD CONDITION.				
241AZ-801 L-A-ANN-PNL		LOCAL ALARM ANNUNCIATION PANEL		
241AZ 241A-271 A-PNL		ALARM PANEL	1.5.1	C.O.B. Liquid Presence Sensor
GOOD CONDITION. EST AGE OF EQUIP 20YRS.				
241AZ WF & SpG MON		WF & SpG MONITORING SUBSYSTEM		
241AZ WFT-101 & 102-1		WEIGHT FACTOR MONITORING SBSYS	1.1.2	Weight Factor Monitoring Subsystem
THE INSTRUMENT AIR SUPPLIES WET, DIRTY, A IR.				
241AZ SPT-101 & 102-1		SpG MONITORING SUBSYSTEM	1.1.2	Weight Factor Monitoring Subsystem

241AZ PT-101 & 102-TUBE	SAMPLE TUBES LEAK DET PIT	1.1.2.1 Sample Tubes (Leak Det. Pit)
SAMPLE TUBES ARE IN GOOD CONDITION.		
241Z PT-101 & 102	WF & SpG PRESSURE SENSORS	1.1.2.2 Weight Factor Pressure Sensors
EST AGE OF EQUIP IS 15YRS. APPEARS TO BE IN GOOD CONDITION.		
241AZ 241AZ-101 & 102-CAB	WF CABINETS	1.1.2.3 Weight Factor Cabinet (Xmitter Enclosure
CABINET DOORS DO NOT SEAL PROPERLY ALLOWING DIRT TO INFILTRATE THE CABINET. CLIMATE CONTROL IS NOT VERY EFFECTIVE-RESISTANCE HEATERS SOMETIMES DOES NOT WORK IN WINTER, NO COOLING CAPACITY FOR SUMMERTIME USE.		
241Z TUBING	FIELD TUBING	1.1.2.4 Field Tubing
TUBING IS ROUTED IN BURIED TUBING FROM REMOTE CABINETS TO 801 BUILDING. TUBING APPEARS TO BE IN GOOD CONDITION BUT HAS BEEN FILLED WITH WATER AND DEBRIS FROM CONDENSATION OF THE INSTRUMENT AIR SYSTEM.		

29-NOV-95 CONDITION ASSESSMENT INFORMATION SYSTEM

CAIS Special Report - RPT-005

Asset	Site Component	Name	Sys No.	System Name
	Survey Component			
	Survey Comment			

241AZ801-0000 : EP BUILDING

241AZ WFAS-101 & 102-1 WF & SpG PRESS SWITCHES IND 1.1.2.5 W.F. Pressure Switches/ Alarms Cabinet

EST AGE OF EQUIP IS 15YRS. LOW REPAIR RATE. CALIBRATE ANNUALLY IN THE FIELD AT 1 HR PER INST. NO RECURRENT PROBLEMS. EQUIPMENT IS DIFFICULT TO ACCESS.

241AZ TK PRI VNT TANK PRIMARY VENTILATION SYS

241AZ FIELD TUBE FEILD INST AIR TUBING 2.1.1.3 FIELD INST AIR TUBING

BLACK POLY TUBING NOT CONDUCTIVE TO PROPER MAINTENANCE.

241AZ PAS-101 & 102-1 PRESSURE SWITCH/ALARM 2.1.1.4 PRESSURE SWITCH/ALARM

EST AGE OF EQUIP IS 20YRS. LOW REPAIR RATE. CALIBRATED ANNUALLY IN THE FIELD AT 1HR PER INST.

241AZ PR-PR-FR-101 & 102-1 PRESSURE RECORDER 2.1.1.5 PRIMARY TK PRESSURE RECORDER

RECORDER REQUIRES FREQUENT MAINTENANCE.

WHC-SD-W314-ES-018, Rev 0

EST AGE OF EQUIP IS 20YRS.

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7.8 Other Reports

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7.9 CAMP Work Sheets

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WHC-SD-W314-ES-018, Rev 0
CAMP RATING FORM

Project Title: AZ T.F.: Leak Control System: Leak Det. Pit: Gamma Rad. Mon. Subsystem

B&R Code: _____ **Rev #:** 0 **FY:** 1996

Project Id #: AZ.I1.1.1 **FUDS:** _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.		30		30
Technological Base (R&D)		30		30
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics				
Criticality				
Infrastructure				40
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				30
Mission Capability, Capacity, & Quality				40
Asset Condition				55
National Business Strategies/Partnerships				
Highest of Each Subcategory	20	30	20	55

PROJECT RATING:	56
Final Project Rating	56

Note: 20 is a Default Rating

C.D. Acree	376-1901	9/22/95
Rated By	Ext	Date Rated

Reviewed By	Ext	Date Reviewed
--------------------	------------	----------------------

Applicable Regulations or Policies

ER/WM, Compliance, 30: Minimum detection capability lacking
M&I, Asset Condition, 55: Aging System, Spare Parts availability concern.
M&I, Infrastructure, 40: Substandard Operation

Additional Information & Affected Projects

M&I, Mission Capability, 40: System not designed to operate in a wet environment.

Shaded Areas Are Not For Use

WHC-SD-W314-ES-018, Rev 0 **CAMP RATING FORM**

Project Title: AZ Tank Farm/Leak Control System/Leak Detection System Pit WF&SpG Monitor

B&R Code: _____ Rev #: 0 FY: 1996

Project Id #: AZ.II.1.2 FUDS: _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.				
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics				
Criticality				
Infrastructure				40
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				50
Asset Condition				50
National Business Strategies/Partnerships				
Highest of Each Subcategory	20	20	20	50

PROJECT RATING: 50

Final Project Rating 50

Note: 20 is a Default Rating

C. D. Acree _____ 9/22/95

Rated By _____ Ext _____ Date Rated _____

Reviewed By _____ Ext _____ Date Reviewed _____

Applicable Regulations or Policies

M&I, Asset Cond., 50: Foxboro equipment is obsolete , spare parts may not be available.

M&I, Capability, 50: Does not measure liquid level directly, uses pressure.

M&I, Infrastructure, 40: System is a continuous user of instrument air.

Additional Information & Affected Projects

Shaded Areas Are Not For Use

WHC-SD-W314-ES-018, Rev 0
CAMP RATING FORM

Project Title: AZ Tank Farm Annulus Leak Instrumentation/ CAM Rad. monitoring System

B&R Code: _____ **Rev #:** 0 **FY:** 1996

Project Id #: AZ.I1.2.1 **FUDS:** _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.				
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety	35			
Fire Protection				
Health Physics	40			
Criticality				
Infrastructure				40
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				40
Asset Condition				35
National Business Strategies/Partnerships				
Highest of Each Subcategory	40	20	20	40

PROJECT RATING:	43
Final Project Rating	43

Note: 20 is a Default Rating

C. D. Acree		9/22/95
Rated By	Ext	Date Rated

Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

H&S, Health Physics, 40: Potential for personnel radiation exposure.
H&S, Industrial Safety, 35: Potential for personnel injury lifting CAM unit (100lbs)

Additional Information & Affected Projects

M&I, Asset Condition, 40: Aging System, subject to false alarms
M&I, Mission Capability, 35: Aging system, not latest recommend site standard, false alarms, radon interf
M&I, Infrastructure, 40: Aging System, subject to false alarms & is difficult to lift.

Shaded Areas Are Not For Use

WHC-SD-W314-ES-018, Rev 0

CAMP RATING FORM

Project Title: AZ Tank Farm Annulus Leak Inst./Liquid Presence Multiple Sensor Probe

B&R Code: _____ Rev #: 0 FY: 1996

Project Id #: AZ.11.2.2 FUDS: _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.		40		
Technological Base (R&D)				30
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics				
Criticality				
Infrastructure				40
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				55
Asset Condition				50
National Business Strategies/Partnerships				
Highest of Each Subcategory	20	40	20	55

PROJECT RATING:	57
Final Project Rating	57

Note: 20 is a Default Rating

C. D. Acree		9/22/95
Rated By	Ext	Date Rated
Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

M&I, Asset Condition, 50: Deteriorated, UV damaged, elec. insulation.
M&I, Mission Capability, 55: Poor leak detect., manual operation, cannot calibrate, cannot verify Operability
ER/WM, Compliance, 40: Fails to detect some leaks, subject to operator interpretation

Additional Information & Affected Projects

M&I, Infrastructure, 40: Aging System, large consumer of instrument air.
M&I, Tech Base, 30: Not a standard industrial design, expensive to fabricate.

Shaded Areas Are Not For Use

WHC-SD-W314-ES-018, Rev 0

CAMP RATING FORM

Project Title: AZ Tank Farm/Pipeline Leak Inst./PitLiquid Leak Detect. Sub. Sys./COB, Transfer

B&R Code: _____ Rev #: 0 FY: 1996

Project Id #: AZ.I1.3.1, SY.I1.3.3, SY.I1.1.3, SY.I1.2.3 FUDS: _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.		50		
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety	35			
Fire Protection				
Health Physics	50			
Criticality				
Infrastructure				50
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				50
Asset Condition				55
National Business Strategies/Partnerships				
Highest of Each Subcategory	50	50	20	55

PROJECT RATING:	60
Final Project Rating	60

Note: 20 is a Default Rating

C. D. Acree		9/22/95
Rated By	Ext	Date Rated

Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

H&S, Health Physics, 50: Potential for maintenance personnel radiation exposure.
H&S, Industrial Safety, 35: Potential for personnel injury working in pits.
ER/WM, Compliance, 50: Cannot detect small leaks or detect secondary containment failure.

Additional Information & Affected Projects

M&I, Asset Condition, 55: Aging System, subject to false alarms
M&I, Mission Capability, 50: System can not detect "small" leaks, can not detect secondary containmen failure, cannot calibrate system, cannot verify system operability.
M&I, Infrastructure, 50: Not compliant with NEC, wiring insulation unsafe, wiring life expectancy is short.

Shaded Areas Are Not For Use

WHC-SD-W314-ES-018, Rev 0

CAMP RATING FORM

Project Title: AZ Tank Farm/Pipeline Leak Inst./Pipeline Annulus Pressure Sensor

B&R Code: _____ Rev #: 0 FY: 1996

Project Id #: AZ.11.3.2 FUDS: _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.		50		
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety	35			
Fire Protection				
Health Physics	50			
Criticality				
Infrastructure				40
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				50
Asset Condition				40
National Business Strategies/Partnerships				
Highest of Each Subcategory	50	50	20	50

PROJECT RATING:	56
Final Project Rating	56

Note: 20 is a Default Rating

C. D. Acree		9/29/95
Rated By	Ext	Date Rated

Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

ER/WM, Compliance, 50: Pipelines do not have Inst. that can detect pl secondary containment failure.
M&I, Mission Capability, 50: System sensitivity is unknown, it cannot be calibrated, is difficult to verify operability, not available on all pipelines.

Additional Information & Affected Projects

H&S, Health Physics, 50: Potential for maintenance personnel radiation exposure.
M&I, Asset Condition, 40: Aging system, suspected corroded valves may inhibit system functionality.
M&I, Infrastructure, 40: System is continual user of instrument air.

(See AZ.11.3.1)

Shaded Areas Are Not For Use

WHC-SD-W314-ES-018, Rev 0

CAMP RATING FORM

Project Title: AZ Tank Farm Pump Permissive (Master Pump Shutdown)

B&R Code: _____ Rev #: 0 FY: 1996

Project Id #: AZ.I1.4 FUDS: _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.				
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics				
Criticality				
Infrastructure				45
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				55
Asset Condition				55
National Business Strategies/Partnerships				
Highest of Each Subcategory	20	20	20	55

PROJECT RATING:	55
Final Project Rating	55

Note: 20 is a Default Rating

C. D. Acree		9/22/95
Rated By	Ext	Date Rated

Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

M&I, Mission Capability, 55: Mission adversely impacted by false alarms, any alarm in all tank farms can shut down a transfer, even in farms that are unrelated.

M&I, Asset Condition, 55: Really the same as the Leak Detection system.

M&I, Infrastructure, 45: Spurious shutdowns cause delays and idle lots of people.

Additional Information & Affected Projects

M&I, Mission Capability, 55: System provides no operational versatility. cannot easily make simultaneous transfers. Cannot easily isolate operations in different facilities.

Shaded Areas Are Not For Use

WHC-SD-W314-ES-018, Rev 0 **CAMP RATING FORM**

Project Title: AZ Tank Farm Remote Alarm Signaling System (Gamewell Loop Sys.)

B&R Code: _____ **Rev #:** 0 **FY:** 1996

Project Id #: AZ.II.6 **FUDS:** _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.				
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics				
Criticality				
Infrastructure				40
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				35
Asset Condition				50
National Business Strategies/Partnerships				
Highest of Each Subcategory	20	20	20	50

PROJECT RATING:	50
Final Project Rating	50

Note: 20 is a Default Rating

<u>C. D. Acree</u>		<u>9/22/95</u>
Rated By	Ext	Date Rated
Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

M&I, Infrastructure, 40: Poor interface design, not standard hardware, spare parts problem.
M&I, Mission Capability, 35: System does not provide unique alarm identification.

M&I, Asset Condition, 50: System in poor condition, maintenance intensive, mostly doesn't work.

Additional Information & Affected Projects

Shaded Areas Are Not For Use

WHC-SD-W314-ES-018, Rev 0

CAMP RATING FORM

Project Title: AZ Tank Farm Tank Waste High Level Alarm Subsystem

B&R Code: _____ Rev #: 0 FY: 1996

Project Id #: AZ.I1.7 FUDS: _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.				
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics	45			
Criticality				
Infrastructure				40
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				55
Asset Condition				55
National Business Strategies/Partnerships				
Highest of Each Subcategory	45	20	20	55

PROJECT RATING:	57
Final Project Rating	57

Note: 20 is a Default Rating

C. D. Acree		9/18/95
Rated By	Ext	Date Rated

Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

M&I, Asset Condition, 55: Aging system, equipment similar to Leak Detection System.
M&I, Mission Capability, 55: System is not intrinsically safe, not suitable for flammable gas environment

Additional Information & Affected Projects

H&S, Health Physics, 45: Probe maintenance will expose workers to radiation.
M&I, Infrastructure, 40: Maintenance of probe is difficult.

WHC-SD-W314-ES-018, Rev 0

CAMP RATING FORM

Project Title: AZ DST DIFFERENTIAL PRESSURE INSTR. SUBSYSTEM

B&R Code: _____ Rev #: 0 FY: 1996

Project Id #: AZ.I2.1.1 FUDS: _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.				
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics				
Criticality				
Infrastructure				40
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				50
Asset Condition				40
National Business Strategies/Partnerships				
Highest of Each Subcategory	20	20	20	50

PROJECT RATING:	50
Final Project Rating	50

Note: 20 is a Default Rating

C. D. Acree		9/22/95
Rated By	Ext	Date Rated

Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

M&I, Asset Condition, 40: Equipment is obsolete (50 yr old design), spare parts availability concern.
M&I, Capability, 50: Recorders are significant maintenance effort. Pressure data is not automatically sent to electronic database.

Additional Information & Affected Projects

M&I, Asset Condition, 40: Some tubing deterioration concerns.
M&I, Infrastructure, 40: Continuous user of instrument air.

NOTE: THESE SENSORS ARE BEING UPGRADED BY PROJECT W-030

Shaded Areas Are Not For Use

WHC-SD-W314-ES-018, Rev 0

CAMP RATING FORM

Project Title: AZ Tank Farm/Waste Flow Monitoring Inst./Service Pit Inst.

B&R Code: _____ Rev #: 0 FY: 1996

Project Id #: AZ.I3.5.1 FUDS: _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.				
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics				
Criticality				
Infrastructure				
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				45
Asset Condition				40
National Business Strategies/Partnerships				
Highest of Each Subcategory	20	20	20	45

PROJECT RATING:	45
Final Project Rating	45

Note: 20 is a Default Rating

C. D. Acree		9/18/95
Rated By	Ext	Date Rated

Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

M&I, Capability, 45: Flow meter cannot measure low flows.
M&I, Asset Condition, 40: Aging system,

Additional Information & Affected Projects

WHC-SD-W314-ES-018, Rev 0

CAMP RATING FORM

Project Title: AZ DST WASTE; THERMOCOUPLE TREES, (SY-102 & SY-103)

B&R Code: _____ Rev #: _____ FY: _____

Project Id #: AZ.I4.1 FUDS: _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.				
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics	40			
Criticality				
Infrastructure				40
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				40
Asset Condition				35
National Business Strategies/Partnerships				
Highest of Each Subcategory	40	20	20	40

PROJECT RATING:	43
Final Project Rating	43

Note: 20 is a Default Rating

C. D. Acree		9/22/95
Rated By	Ext	Date Rated
Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

M&I, Capability, 40: Elements can not be calibrated. Elements spaced at 2 ft intervals limit capability.
 Iron lead is subject to corrosion. Note: Probe may not withstand mixer pump forces.
 H&S, Health Physics, 40: Probe maintenance will expose workers to radiation.

Additional Information & Affected Projects

M&I, Infrastructure, 40: Elements are not replaceable, probe is not maintainable.
 M&I, Asset Condition, 35: Equipment is old, but functional

Shaded Areas Are Not For Use

WHC-SD-W314-ES-018, Rev 0

CAMP RATING FORM

Project Title: AZ DST WASTE; FIC LIQUID SURFACE LEVEL INST. SUBSYSTEM

B&R Code: _____ Rev #: _____ FY: _____

Project Id #: AZ.14.4 FUDS: _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.				
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics	35			
Criticality				
Infrastructure				50
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				60
Asset Condition				60
National Business Strategies/Partnerships				
Highest of Each Subcategory	35	20	20	60

PROJECT RATING:	61
Final Project Rating	61

Note: 20 is a Default Rating

C. D. Acree		9/29/95
Rated By	Ext	Date Rated
Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

M&I, Asset Condition, 60: FIC gauges are inoperative. Extensive maintenance is normally required.
M&I, Capability, 60: FIC Gauges have poor resolution.
M&I, Infrastructure, 50: Poor resolution of FIC gauges exacerbates mass balance computation
for checking waste transfer operations.

Additional Information & Affected Projects

H&S, Health Physics, 35: Maintenance of the FIC may expose workers to radiation.
M&I, Infrastructure, 50: Future spare parts problem.

Shaded Areas Are Not For Use

WHC-SD-W314-ES-018, Rev 0
CAMP RATING FORM

Project Title: AZ Tank Farm/Pipeline Heat Trace I&C Subsystem

B&R Code: _____ Rev #: 0 FY: 1996

Project Id #: AZ.17 FUDS: _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.				
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics				
Criticality				
Infrastructure				40
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				40
Asset Condition				50
National Business Strategies/Partnerships				
Highest of Each Subcategory	20	20	20	50

PROJECT RATING:	50
Final Project Rating	50

Note: 20 is a Default Rating

C. D. Acree		9/29/95
Rated By	Ext	Date Rated

Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

M&I, Asset Condition, 50: Some Pipelines have broken heat trace heaters.
M&I, Capability, 40:
M&I, Infrastructure, 40: Lack of pipe heating may affect transfer capability on some pipelines.

Additional Information & Affected Projects

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Accession #: D196011696

Document #: SD-W314-ES-018

Title/Desc:

PROJECT W-314 DST & DCRT INSTRUMENT & CONTROL
SYSTEMS INITIAL ASSESSMENT [SEC 3 OF 3]

Pages: 349

This document was too large to scan as a whole document, therefore it required breaking into smaller sections.

DOCUMENT NUMBER: SD-W314-ES-018

SECTION 3 OF 3

TITLE: PROJECT W-314 DST + DCRT INSTRUMENT +
CONTROL SYSTEMS INITIAL ASSESSMENT
(REV 0)

DATE: 01/23/96

ORIGINATOR: ACREE CD

CO: WHC

RECIPIENT: _____

CO: DOE-RL

REFERENCES: EDT-601994

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8.0 SY TANK FARM

8.1 PDRD Cross Reference Tables

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PROJECT W-314 PDRD CROSS REFERENCED TABLE INSTRUMENT & CONTROL SYSTEMS				
PDRD FUNCTION ID#	PDRD FUNCTION VERB	PDRD DATA VARIABLE	EQUIPMENT REFERENCE TREE	COMMENTS
3.2.1.1.1.1.1	Monitor	Hydroxide conc. Nitrate concentration Nitrite concentration Sodium concentration Specific Gravity	Non-existent architecture Non-existent architecture Non-existent architecture Non-existent architecture SY.14.3.1	Manual Sampling, Lab. Analysis function All three tanks have SpG Monitoring System
3.2.1.1.1.1.2	Compare	Hydroxide conc. Nitrate concentration Nitrite concentration	Non-existent architecture Non-existent architecture Non-existent architecture	Lab. Analysis function
3.2.1.1.1.2.1.2	Compare	Specific Gravity	Non-existent architecture	Administrative function, The SpG Monitoring System is just Monitoring.
3.2.1.1.1.2.1.3	Compare	Sodium concentration	Non-existent architecture	Lab. Analysis function
3.2.1.1.1.2.1.4	Compare	Pu concentration	Non-existent architecture	Lab. Analysis function
3.2.1.1.1.3	Alarm	Waste composition	Non-existent architecture	Administrative function
3.2.1.1.1.4	Control	Waste composition	Non-existent architecture	Administrative function
3.2.1.1.1.5	Monitor	Supernate Liquid Level	SY.14.4.2 SY.11.7	Old FIC gauges are replaced with Enraf gauges Old high level probes, field wiring and relays may require replacement. The PDRD should reassess the need for this function in light of the intrinsic safety requirement.
3.2.1.1.1.6	Compare	Supernate Liquid Level	Not Assessed SY.11.4	Old CASS computer function, some new TMACS functions Old relays work in Master Pump Shutdown (re: SY.11.4)
3.2.1.1.1.7	Alarm	Supernate Liquid Level	Not Assessed SY.11.5	Old CASS computer function, some new TMACS functions Local Alarm function (re: SY.11.5)
3.2.1.1.1.8	Control	Supernate Liquid Level	Not Assessed SY.13.1	Administrative function, manual pump control.

PROJECT W-314 PDRD CROSS REFERENCED TABLE INSTRUMENT & CONTROL SYSTEMS				
PDRD FUNCTION ID#	PDRD FUNCTION VERB	PDRD DATA VARIABLE	EQUIPMENT REFERENCE TREE	COMMENTS
3.2.1.1.1.9	Monitor	Waste Temperature	SY.14.1	Connected to TMACS on some trees.
3.2.1.1.1.10	Compare	Waste Temperature	Not Assessed	TMACS function
3.2.1.1.1.11	Alarm	Waste Temperature	Not Assessed	TMACS function
3.2.1.1.1.12 3.2.1.2.1.1	Control	Waste Temperature (Indirectly) Ventilation System Airflow	Not Assessed re: SY.12.1.5 See HVAC Assessment	Administrative function Manual adjustment required Old HVAC System is being upgraded.
3.2.1.1.1.13	Monitor	Waste Level	SY.14.4.2	Enrafs replaced the old FLC. See part 3.2.1.1.1.5
3.2.1.1.1.14	Compare	Waste Level	Not Assessed	See 3.2.1.1.1.6
3.2.1.1.1.15	Alarm	Waste Level	Not Assessed	See 3.2.1.1.1.7
3.2.1.1.1.16	Control	Waste Level	No automatic control architecture, re: SY.13.1	Administrative function
3.2.1.1.1.17(.1)	Monitor	Leak Det. Pit Radiation Level	SY.11.1.1	
3.2.1.1.1.17(.1)	Monitor	Leak Det. Pit Temperature	SY.11.1.4, Not Assessed	Suggest deletion of instrument and revised PDRD.
3.2.1.1.1.17(.1)	Monitor	Leak Det. Pit Waste Level	SY.11.1.2	
3.2.1.1.1.17(.2)	Monitor	Tank Annulus Radiation Level	SY.11.2.1	
3.2.1.1.1.17(.2)	Monitor	Tank Annulus Liquid Presence/Level	SY.11.2.2	
3.2.1.1.1.18	Compare	Leak Det. Pit Radiation Level	SY.11.1.1.5	
3.2.1.1.1.18	Compare	Leak Det. Pit Temperature	Not Assessed	Suggest deletion and revised PDRD.

PROJECT W-314 PDRD CROSS REFERENCED TABLE INSTRUMENT & CONTROL SYSTEMS				
PDRD FUNCTION ID#	PDRD FUNCTION VERB	PDRD DATA VARIABLE	EQUIPMENT REFERENCE TREE	COMMENTS
3.2.1.1.1.18	Compare	Leak Det. Pit Water Level	SY.11.1.2.5	
3.2.1.1.1.18	Compare	Tank Annulus Radiation Level	SY.11.2.1.4	
3.2.1.1.1.18	Compare	Tank Annulus Liquid Presence/Level	SY.11.2.2	
3.2.1.1.1.19	Alarm	Leakage From Tank Bottom	SY.11.2.1.4	
3.2.1.1.1.19	Alarm	Leakage From Tank Annulus	SY.11.1.2.5 SY.11.1.1.5	
3.2.1.1.1.20	Control	Leakage From Tank Bottom	Not Assessed re: SY.13.1 & L.D.P. pump	Administrative function
3.2.1.1.1.20	Control	Leakage From Tank Annulus Bottom	Not Assessed	Administrative function
3.2.1.1.1.21	Monitor	Leak Det. Pit Liquid Level	See 3.2.1.1.1.17(1)	
3.2.1.1.1.22	Compare	Leak Det. Pit Liquid Level	See 3.2.1.1.1.18	
3.2.1.1.1.23	Alarm	Leak Det. Pit Liquid Level	See 3.2.1.1.1	
3.2.1.1.1.24	Control	Leak Det. Pit Liquid Level	SY.11.1.2.5	
3.2.1.1.1.25	Monitor	Tank Vapor Space Temperature Gradient	SY.14.1	Old CASS Data Loggers. Old manual operation.
3.2.1.1.1.26	Compare	Tank Vapor Space Temperature Gradient	Not Assessed	Old CASS operation.

PROJECT W-314 PDRD CROSS REFERENCED TABLE INSTRUMENT & CONTROL SYSTEMS				
PDRD FUNCTION ID#	PDRD FUNCTION VERB	PDRD DATA VARIABLE	EQUIPMENT REFERENCE TREE	COMMENTS
3.2.1.1.1.27	Alarm	Tank Vapor Space Temperature Gradient	Not Assessed	Old CASS operation.
3.2.1.1.1.28	Control	Tank Vapor Space Temperature Gradient	Not Assessed re: SY.12.1.5	Administrative function
3.2.1.1.1.29	Monitor	Tank [Concrete] Structure Temperature	SY.16.4	Old Data Logger connects to CASS.
3.2.1.1.1.30	Compare	Tank [Concrete] Structure Temperature	Not Assessed	Old CASS operation.
3.2.1.1.1.31	Alarm	Tank [Concrete] Structure Temperature	Not Assessed	Old CASS operation.
3.2.1.1.1.32 3.2.1.2.1.1.2	Control	Tank [Concrete] Structure Temperature (indirectly) Ventilation System Airflow	Not Assessed re: SY.12.1.5	Administrative function
3.2.1.1.1.33	Monitor	Tank Vapor Space Pressure	SY.12.1.1.2 SY.12.1.1.5	
3.2.1.1.1.34	Compare	Tank Vapor Space Pressure	SY.12.1.1.4	
3.2.1.1.1.35	Alarm	Tank Vapor Space Pressure	SY.12.1.1.4	
3.2.1.1.1.36	Control	Tank Vapor Space Pressure	Not Assessed re: SY.12.1.5 & SY.12.1.6	Administrative function.
3.2.1.1.1.37	Monitor	Tank Flammable Gas Concentration	SY.14.2, Not Assessed	New System (SHMS)

PROJECT W-314 PDRD CROSS REFERENCED TABLE INSTRUMENT & CONTROL SYSTEMS					
PDRD FUNCTION ID#	PDRD FUNCTION VERB	PDRD DATA VARIABLE	EQUIPMENT REFERENCE TREE	COMMENTS	
3.2.1.1.1.38	Compare	Tank Flammable Gas Concentration	SY.I4.2, Not Assessed	New System (SHMS)	
3.2.1.1.1.39	Alarm	Tank Flammable Gas Concentration	SY.I4.2, Not Assessed	New System (SHMS)	
3.2.1.1.1.40 3.2.1.2.4 3.2.1.2.5	Control (Maintain, Adjust)	Tank Flammable Gas Concentration Tank Ventilation System Airflow	Not Assessed re: SY.I2.1.5 & SY.I2.1.6	Administrative function. Trade Study should assess need for tie-in to HVAC control system.	
3.2.1.1.1.41	Monitor	Untreated Gaseous Effluent Temperature	SY.I2.1.3		
3.2.1.1.1.42	Monitor	Treated Gaseous Effluent Radionuclide Particulate Concentrations	SY.I2.1.8		
3.2.1.1.1.42	Monitor	Treated Gaseous Effluent Temperature	SY.I2.1.8		
3.2.1.1.1.42	Monitor	Treated Gaseous Effluent Moisture level	Non-existent architecture		
3.2.1.1.1.42	Monitor	Treated Gaseous Effluent Organic Vapor Concentration	Non-existent architecture		
3.2.1.1.1.42	Monitor	Treated Gaseous Effluent Hazardous/ Toxic Vapor - Particulate Concentrations	Non-existent architecture		

PROJECT W-314 PDRD CROSS REFERENCED TABLE INSTRUMENT & CONTROL SYSTEMS				
PDRD FUNCTION ID#	PDRD FUNCTION VERB	PDRD DATA VARIABLE	EQUIPMENT REFERENCE TREE	COMMENTS
3.2.1.1.1.43(1)	Compare	Treated Gaseous Effluent Radionulide Particulate Concentrations	SY.12.1.8 See HVAC Assessment	
3.2.1.1.1.43	Compare	Treated Gaseous Effluent Temperature	SY.12.1.8	
3.2.1.1.1.43	Compare	Treated Gaseous Effluent Moisture Level	Non-existent architecture	
3.2.1.1.1.43	Compare	Treated Gaseous Effluent Organic Vapor Concentration	Non-existent architecture	
3.2.1.1.1.43(2)	Compare	Treated Gaseous Effluent Hazardous/ Toxic Vapor - Particulate Concentrations	Non-existent architecture	
3.2.1.1.1.44	Alarm	Treated Gaseous Effluent Radionulide Particulate Concentrations	SY.12.1.9	Recorders in 242-A should be functionally replaced..
3.2.1.1.1.44	Alarm	Treated Gaseous Effluent Temperature	Not Assessed	
3.2.1.1.1.44	Alarm	Treated Gaseous Effluent Moisture Level	Non-existent architecture	

PROJECT W-314 PDRD CROSS REFERENCED TABLE INSTRUMENT & CONTROL SYSTEMS				
PDRD FUNCTION ID#	PDRD FUNCTION VERB	PDRD DATA VARIABLE	EQUIPMENT REFERENCE TREE	COMMENTS
3.2.1.1.1.44	Alarm	Treated Gaseous Effluent Organic Vapor Concentration	Non-existent architecture	
3.2.1.1.1.44	Alarm	Treated Gaseous Effluent Hazardous/ Toxic Vapor - Particulate Concentrations	Non-existent architecture	
3.2.1.1.1.45	Control	Treated Gaseous Effluent Radionuclide Particulate Concentrations	Not Assessed	Administrative function.
3.2.1.1.1.45	Control	Treated Gaseous Effluent Temperature	Not Assessed	Administrative function.
3.2.1.1.1.45 3.2.1.2.7	Control	Treated Gaseous Effluent Moisture Level (Indirectly) Tank Ventilation System	Non-existent architecture	Administrative function.
3.2.1.1.1.45	Control	Treated Gaseous Effluent Organic Vapor Concentration	Non-existent architecture	Administrative function.
3.2.1.1.1.45 3.2.1.2.8	Control	Treated Gaseous Effluent Hazardous/ Toxic Vapor - Particulate Concentrations (Indirectly) Tank Ventilation System	Non-existent architecture	Administrative function.

PROJECT W-314 PDRD CROSS REFERENCED TABLE INSTRUMENT & CONTROL SYSTEMS				
PDRD FUNCTION ID#	PDRD FUNCTION VERB	PDRD DATA VARIABLE	EQUIPMENT REFERENCE TREE	COMMENTS
3.2.1.1.2.2	Monitor	Essential Transfer Tank Systems/Equipment Operability Status (eg. vent. sys., waste level monitor, etc)	Non-existent architecture	Presently, Operator rounds required.
3.2.1.1.2.3	Monitor	Essential Interconnecting Systems/Equipment Operability Status (eg. heat trace, valves, pumps, etc)	SY.I6, Not Assessed	Presently, Operator rounds required.
3.2.1.1.2.4	Monitor	Transfer System Operability Status (leak detection system)	SY.I1.3 SY.I1.4	Presently, Operator rounds required.
3.2.1.1.2.5	Monitor	Essential Equipment Operability Status	SY.I6	Presently, Operator rounds required.
3.2.1.1.2.6	Monitor	Waste Parameters Temperature Viscosity Specific Gravity	SY.I4 SY.I4.1 SY.I4.3	SpG monitoring is available on all three tanks
3.2.1.1.2.7	Detect	Waste Transfer System Containment Leaks	SY.I1.3	
3.2.1.1.2.8	Monitor	Effluents	Non-existent architecture	No effluents in the Tank Farm. Service pit monitors water flow utilized for washdown.
3.2.1.1.2.9	Monitor	Motive Force	See Electrical Assessment (re: SY.I3.1)	Manual ON-OFF controls, local indicators of ON-OFF condition.
3.2.1.1.2.9	Control	Motive Force	See Electrical Assessment (re: SY.I3.1)	Manual ON-OFF controls

PROJECT W-314 PDRD CROSS REFERENCED TABLE INSTRUMENT & CONTROL SYSTEMS				
PDRD FUNCTION ID#	PDRD FUNCTION VERB	PDRD DATA VARIABLE	EQUIPMENT REFERENCE TREE	COMMENTS
3.2.1.1.2.10	Monitor	Transfer Route Isolation Devices	I&C Non-existent architecture (re: SY.13.3) See Pipeline Assessment	Manual Indication.
3.2.1.1.2.10	Control	Transfer Route Isolation Devices	I&C Non-existent architecture (re: SY.13.3) See Pipeline Assessment	Manual Operation.
3.2.1.1.2.11	Monitor	Transfer Line Waste Flow Rate	Non-existent architecture	
3.2.1.1.2.12	Monitor & Compare (Verify)	Transfer Volume	Non-existent architecture	Administrative function.
3.2.1.1.2.13	Alarm (Annunciate)	Waste Transfer System-Structure- Component Fault(s)	SY.11.5	Administrative function. Alarm Status assessed via Operator rounds & via CASS reports.
3.2.1.1.14	Control (Activate)	Waste Transfer Safe Shutdown Systems	SY.11.4	
3.2.1.1.2.15	Monitor & Compare (Verify)	Waste Transfer System Safe Shutdown	Non-existent architecture	Function not implemented with I & C.
3.2.1.1.2.16	Control (Secure)	Failed Waste Transfer System Equipment	Non-existent architecture	Function not implemented with I & C.
3.2.1.1.1.3	Manage Obtain Analyze Process Store Archive	System Data/Information	Data Acquisition Systems not assessed. SY.11.2.1.4 SY.12.1.1.5 SY.11.6 (re: SY.14.4.5)	Chart recorders in 241-SY-271 and 242-S should be functionally replaced.
3.2.1.2.3.1	Monitor	Tank Annulus Pressure	SY.12.2.1 See HVAC Assessment	Existing equipment is manual.

PROJECT W-314 PDRD CROSS REFERENCED TABLE INSTRUMENT & CONTROL SYSTEMS					
PDRD FUNCTION ID#	PDRD FUNCTION VERB	PDRD DATA VARIABLE	EQUIPMENT REFERENCE TREE	COMMENTS	
3.2.1.2.3.1	Control (Maintain)	Tank Annulus Pressure	Not Assessed re: SY.12.1.5	Manual operator function.	
3.2.1.3.4	Monitor	Waste Transfer System Containment Pressure	Not assessed re: SY.13.4 See Pipeline Assessment		
3.2.1.3.4	Control	Waste Transfer System Containment Pressure	Not Assessed See Pipeline Assessment		
3.3.1.2.3.1	Monitor	Sludge Volume	SY.14.5 Not Assessed		
3.3.4.1.6	Monitor	CAMs Radiation Remote Centralized Data & Alarm Display	Not Assessed	Personel protection monitoring is not monitored by TMACS. Local indication only.	

8.2 Functions Assessment Tables

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EXISTING TANK FARM EQUIPMENT FUNCTIONS ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS						
REF. NO	SYSTEM NAME	FUNCTION OR CONSTRAINT			METHOD OF ANALYSIS I. Analysis II. Inspection III. Testing	BRIEF REASON FOR DECISION
		DESCRIPTION	SOURCE	MET		
SY.11	LEAK CONTROL SYSTEM	3.2.1.1.2.4	PDRD			
SY.11.1	LEAK DET. PIT/SUMP INST.					
SY.11.1.1	Gamma Radiation Monitoring Subsystem	3.2.1.1.1.17	PDRD	NO	I. See the Engineering Analysis. IIa. See Field Inspection Questionnaire. IIb. See CAS Data Sheets.	The instrument thimble often contains water due to condensation and possible rainwater infiltration. Sensor connector and cable are sometimes underwater. The system is not designed for submerged use. Cable life expectancy in this environment is poor. Operation is not reliable. Minimum detectable liquid leak rates are not defined for this system.
SY.11.1.2	Weight Factor & Specific Gravity Monitoring Subsystem	3.2.1.1.1.17	PDRD	NO	I. See the Engineering Analysis. IIa. See Field Inspection Questionnaire. IIb. See CAS Data Sheets.	Liquid presence and/or level measurement is required. Level is not measured directly, but is calculated from pressure measurements. This is obsolete equipment and the manufacturer may not support spare parts availability for long. Better instrumentation exists that does not use instrument air. Degradation of inst. air piping in SY farm has lead to a degradation of inst. air quality with potential pneumatic inst. problems. A Trade Study should be carried out to verify the need for this architecture.
SY.11.1.3	Liquid Presence Sensor and Buried wiring	3.2.1.1.1.17	1. PDRD, WAC-173-303- #160(K)(c)(iii), 40CFR-Ch1- #265.193(c)(3)	NO	I. See the Engineering Analysis. IIa. See Field Inspection Questionnaire. IIb. See CAS Data Sheets.	The existing device will not measure low leak rates due to its design. Its operability cannot be easily verified and it cannot be tested electrically. It cannot be calibrated. The wiring in the pits is not NEC code compliant. "SO" cords are not suitable for buried or conduit use. Further, most of these cords are deteriorating.
SY.11.1.4	Liquid Temperature Sensor	3.2.1.1.1.17	PDRD	YES	I. See the Engineering Analysis.	Although this device meets PDRD requirements, it could be eliminated as redundant instr. as it adds little value to leak detection.

EXISTING TANK FARM EQUIPMENT FUNCTIONS ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS						
REF. NO	SYSTEM NAME	FUNCTION OR CONSTRAINT			METHOD OF ANALYSIS I. Analysis II. Inspection III. Testing	BRIEF REASON FOR DECISION
		DESCRIPTION	SOURCE	MET		
SY.11.2	ANNULUS LEAK INSTRUMENTATION	Secondary Containment Leak Detection	40CFR- CH1 -#265.193(c)(3), WAC-173-303	NO	I. See the Engineering Analysis.	Leakage from secondary tank walls may be absorbed in the soil. Secondary containment floor leaks may be detected by the Leak Detection Pit systems.
SY.11.2.1	Annulus CAM Radiation Monitoring Subsystem	3.2.1.1.1.17	PDRD, 40CFR- CH1 -#265.193(c)(3), WAC-173-303	YES	I. See the Engineering Analysis. IIa. See Field Inspection Questionnaire. IIb. See CAS Data Sheets.	This system is too sensitive to Radon gas, which yields false alarms. System beta/gamma sensitivity specification is somewhat arbitrary (see WHC-TI-357; 600 CMP = 3 * BASELINE). Maintenance/calibration of the system is difficult because of lifting requirements. The recorder requires extensive maintenance. A Trade Study should be carried out to determine the efficiency of this type of instrument and the appropriateness of this application.
SY.11.2.2	Liquid Presence Sensor (Flake Box & Manual Tape Conductivity Probe)	3.2.1.1.1.17	PDRD, WAC-173-303- #160(d)(c)(iii), 40CFR-CH1 - #265.193(c)(3)	NO	I. See the Engineering Analysis. IIa. See Field Inspection Questionnaire IIb. See CAS Data Sheets.	The Device cannot detect low leak rates. The old device is manually operated. Thus the level detected is subject to operator interpretation & the resolution is poor. This device requires an Operator to enter the farm to operate. This device is a very large consumer of Inst. Air. This device housing is damaged by UV radiation. The basic Design is a problem.
SY.11.2.3	Annulus Pump Pit Liquid Presence Sensor	3.2.1.1.1.17	PDRD	NO	I. See the Engineering Analysis.	See SY.11.3.3

**EXISTING TANK FARM EQUIPMENT
FUNCTIONS ASSESSMENT TABLE**
INSTRUMENTS & CONTROL SYSTEMS

REF. NO	SYSTEM NAME	FUNCTION OR CONSTRAINT			METHOD OF ANALYSIS I. Analysis II. Inspection III. Testing	BRIEF REASON FOR DECISION
		DESCRIPTION	SOURCE	MET		
SY.11.3	PIPELINE LEAK INSTRUMENTATION	3.2.1.1.2.7 Secondary Containment Leak Detection	PDRD, WAC-173-303- 303#1604(c)(iii) 40CFR- CH1 #265.193(c)(3)	NO	I. See the Engineering Analysis.	The detection system cannot detect a failure of pipeline secondary containment. The detection system cannot detect a failure of "Transfer Pits". A Trade Study should pull together the various environmental interpretations, permits and waiver request to confirm the need for this type of system. The existing sensor will not detect low leak rates due to its design. Its operability cannot be easily verified and it cannot be tested electrically. It cannot be calibrated. NEC Code compliance issue. Existing wiring insulation is brittle and cracked. Current sensitive relays are not (& cannot be) calibrated with the sensor.
SY.11.3.1	C.O.B. Liquid Presence Sensor	3.2.1.1.2.7	PDRD, WAC-173-303- #1604(c)(iii), 40CFR-CH1- #265.193(c)(3)	NO	I. See the Engineering Analysis. IIa. See Field Inspection Questionnaire. IIb. See CAS Data Sheets.	Adequate "status of the route isolation" is not provided for all the transfer routes. An Engineering Study will be needed to determine if more pressure switches are required.
SY.11.3.2	Pipeline Pressure Switch Sensor	3.2.1.1.2.10 3.2.1.3.4	PDRD	NO	I. See the Engineering Analysis.	This sensor will not detect low leak rates due to its design. Its operability cannot be easily verified and it cannot be tested electrically. It cannot be calibrated. Rain and melting snow infiltration are often causes of false alarms. Current sensitive relays are not (& cannot be) calibrated with the sensor.
SY.11.3.3	Transfer Pits: Liquid Presence Sensor (Feed Pump Pit, Valve Pit, Central Pump Pits, Flush Pit, Drain Pit)	3.2.1.1.2.7	PDRD, WAC-173-303- #1604(c)(iii), 40CFR-CH1- #265.193(c)(3)	NO	I. See the Engineering Analysis. IIa. See Field Inspection Questionnaire. IIb. See CAS Data Sheets.	The terminal boxes that house the field alarm lamps have had their NEMA rating ruined by incorrect modifications. Wiring inside boxes has badly deteriorated insulation. The wiring is bad and in general does not comply with NEC requirements. "SQ" cord is not rated for buried or conduit applications.
SY.11.3.5	Service Pit Instrumentation (LDE only)	3.2.1.1.2.7	PDRD	NO	I. See the Engineering Analysis.	See SY.11.3.3

**EXISTING TANK FARM EQUIPMENT
FUNCTIONS ASSESSMENT TABLE**
INSTRUMENTS & CONTROL SYSTEMS

REF. NO	SYSTEM NAME	FUNCTION OR CONSTRAINT			METHOD OF ANALYSIS I. Analysis II. Inspection III. Testing	BRIEF REASON FOR DECISION
		DESCRIPTION	SOURCE	MET		
SY.11.4	PUMP PERMISSIVE INSTRUMENTATION (Master Pump shutdown)	3.2.1.1.2.9 3.2.1.1.2.10 3.2.1.3.10	PDRD	NO	I. See the Engineering Analysis.	The existing system does not allow interlock versatility. (Its all or nothing.) You can not set up a transfer route and have only the appropriate leak sensors for that route active.
SY.11.4.4	[242-S M.P.S Relay Panel]	3.2.1.1.2.9 3.2.1.1.2.10 3.2.1.3.10	PDRD	NO	I. See the Engineering Analysis.	This system ties the West Area tank farms together and does not allow interlock versatility. (Its all or nothing.) You can not set up a transfer route and have only the appropriate leak sensors for that route active.
SY.11.5	LOCAL ALARM ANNUNCIATION & ALARM PANELS	3.2.1.1.2.2 3.2.1.1.2.3 3.2.1.1.2.4 3.2.1.1.2.5 3.2.1.1.2.13 3.2.1.1.3	PDRD	NO	I. See the Engineering Analysis. IIa. See Field Inspection Questionnaire. IIb. See CAS Data Sheets.	re: SY.11.3.4. The terminal boxes that house the field alarm lamps have had their NEMA function ruined by incorrect modifications. They are no longer weather tight. These boxes leak rainwater badly. Replacement of the leak detection & M.P.S. system may render part of the old PANALARM non-functional. SY-271 Panel indicators, in general, do not appear to comply with NUREG-0700 design guidelines which deal with alarm identification.
SY.11.6	REMOTE ALARM SIGNALING (GAMEWELL LOOP)	3.2.1.1.3	PDRD	NO	I. See the Engineering Analysis. IIa. See Field Inspection Questionnaire. IIb. See CAS Data Sheets.	This Signaling system does not allow identification of individual leak sensing elements. The system has a long history of maintenance problems. Replacement of the leak detection & M.P.S. system may achieve this function with modern architecture and eliminate the need for a separate system.
SY.12	VENTILATION CONTROL SYSTEM					
SY.12.1	TANK PRIMARY VENTILATION SYSTEM					Old system was assessed.

**EXISTING TANK FARM EQUIPMENT
FUNCTIONS ASSESSMENT TABLE**
INSTRUMENTS & CONTROL SYSTEMS

REF. NO	SYSTEM NAME	FUNCTION OR CONSTRAINT			METHOD OF ANALYSIS I. Analysis II. Inspection III. Testing	BRIEF REASON FOR DECISION
		DESCRIPTION	SOURCE	MET		
SY 12.1.1	Tank Diff. Pressure Instr. Subsystem	1. 3.2.1.1.1.33 2. 3.2.1.1.1.34 3. 3.2.1.1.1.35	1. PDRD 2. PDRD 3. PDRD	NO NO NO	I. See the Engineering Analysis. IIa. See Field Inspection Questionnaire. IIb. See CAS Data Sheets.	This equipment is obsolete. Acquisition of spare parts in the future may be difficult. The length of time that Manufacturer support will be available is uncertain. Better equipment exists which does not use instrument air. Future Sy farm instrument air quality is suspect because of poor pipelines. Old chart recorders do not connect to Electronic Database directly; thus record keeping requires handling paper strips.
SY 12.1.2	HEPA Filter Diff. Pressure Instr.	3.2.1.2.9	PDRD	NO	I. See the Engineering Analysis.	Record keeping of filter degradation requires manual data gathering. No electronic database capability is available.
SY 12.1.3	Temperature Instrumentation	1. 3.2.1.1.1.41 2. 3.2.1.2.9	PDRD	NO	I. See the Engineering Analysis. IIa. See Field Inspection Questionnaire. IIb. See CAS Data Sheets.	Temperature probes have high failure rates. Record keeping of temperature requires manual data gathering. No electronic database capability is available.
SY 12.1.4	Heater Control Subsystem	3.2.1.1.1.41	PDRD	NO	I. See the Engineering Analysis. IIa. See Field Inspection Questionnaire. IIb. See CAS Data Sheets.	Heater controls require extensive maintenance, and cannot be calibrated.
SY 12.1.5	Fan-Motor Control Subsystem	3.2.1.2.9 3.2.1.2.10	PDRD		I. See the Engineering Analysis. IIa. See Field Inspection Questionnaire. IIb. See CAS Data Sheets.	Automatic change-over circuits do not operate correctly. Control circuits are in poor condition.
SY 12.1.6	Damper Control Subsystem	3.2.1.2.10	PDRD		I. See the Engineering Analysis. IIa. See Field Inspection Questionnaire. IIb. See CAS Data Sheets.	Damper actuators and linkages are in poor condition on K2-5-2 system.
SY 12.1.8	Regulated Stack Monitoring System (296-A-271)	3.2.1.1.1.42 Inst. Sensitivity (DCG)	PDRD WHC-SD-EN-TI-288	NO	I. See the Engineering Analysis. IIa. See Field Inspection Questionnaire. IIb. See CAS Data Sheets.	System does not comply with WDOE requirements.

EXISTING TANK FARM EQUIPMENT FUNCTIONS ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS						
REF. NO	SYSTEM NAME	FUNCTION OR CONSTRAINT			METHOD OF ANALYSIS I. Analysis II. Inspection III. Testing	BRIEF REASON FOR DECISION
		DESCRIPTION	SOURCE	MET		
SY.12.2	TANK ANNULUS VENTILATION SYSTEM					(See HVAC section.)
SY.12.2.1	Annulus Diff. Pressure Inst. System	3.2.1.1.2.3.1	PDRD	YES ²	I. See the Engineering Analysis. IIa. See Field Inspection Questionnaire. IIb. See CAS Data Sheets.	The existing system is manually read in the farm. ² A Trade Study should establish the need for automation of this instrumentation which would reduce the need for Operator entry into the farms.
SY.13	TRANSFER LINE CONTROL SYSTEM	3.2.1.1.2.5 3.2.1.1.2.8	PDRD	NO	I. See the Engineering Analysis.	Effluents are not monitored.
SY.13.1	PUMP CONTROL SUBSYSTEM	3.2.1.1.2.9	PDRD	NO	I. See the Engineering Analysis.	Monitoring of Motive Force Devices is minimal, eg. no current monitoring is carried out.
SY.13.2	VALVE POSITION INSTRUMENTATION/ INDICATION (No automation)	3.2.1.1.2.10	PDRD	NO ²	I. See the Engineering Analysis.	² Electronic Feedback of route isolation status does not exist. Transfer route identification cannot be electronically verified because valve position is not remotely monitored. Limit switches are problematic, but new technology exists which could provide continuous position indication.
SY.13.3	VALVE CONTROL SYSTEM (DOV in Flush Pit)	3.2.1.1.2.10	PDRD	NO ³	I. See the Engineering Analysis.	³ Motorized valve control does not exist.
SY.13.4	PRESSURE SWITCH INSTRUMENTATION (Flow Indication) (Flush Pit)	3.2.1.1.2.9	PDRD	NO ⁴	I. See the Engineering Analysis.	⁴ Requirements for pipeline pressure sensor for monitoring misrouting is not clearly defined in the PDRD. Transfer route identification cannot be electronically verified because all pipelines are not monitored for pressure or flow. The PDRD should clarify which pipelines require this function.
SY.13.5	WASTE FLOW MONITORING INSTRUMENTATION (Service Pit & Flush Pit)	3.2.1.1.2.11	PDRD	NO ⁵	I. See the Engineering Analysis.	⁵ Waste Flow Inst. does not exist. The PDRD should clarify which pipelines require this function.
SY.13.5.1	Service Pit Instrument Subsystems					

**EXISTING TANK FARM EQUIPMENT
FUNCTIONS ASSESSMENT TABLE**
INSTRUMENTS & CONTROL SYSTEMS

REF. NO	SYSTEM NAME	FUNCTION OR CONSTRAINT			METHOD OF ANALYSIS I. Analysis II. Inspection III. Testing	BRIEF REASON FOR DECISION
		DESCRIPTION	SOURCE	MET		
SY.13.5.1.1	<i>Flow Monitor & Totalizer</i>	3.2.1.1.2.1.1	PDRD	NO	I. See the Engineering Analysis. IIa. See Field Inspection Questionnaire. IIb. See CAS Data Sheets.	The flow instrument/totalizer cannot detect small flow rates (less than 5 gpm).
SY.13.5.1.2	<i>Radiation (Gamma) Monitor</i>					
SY.13.5.1.3	<i>Pipeline Pressure</i>					Not Assessed. The PDRD does not clearly define this function.
SY.14	TANK CONTENTS MONITORING SYSTEM	3.2.1.1.2.6	PDRD	NO	I. See the Engineering Analysis.	Not Assessed
SY.14.1	TEMPERATURE/VAPOR INSTRUMENTATION	3.2.1.1.1.9 3.2.1.1.1.25 3.2.1.2.1.1.1	PDRD	YES ¹	I. See the Engineering Analysis.	In most cases, these systems do not exist. The PDRD should clarify the need for these data types. MITs are in SY-101 & SY-103. Old trees are in SY-102 & SY-103
SY.14.2	STANDARD HYDROGEN MONITORING SYSTEM	3.2.1.1.1.37	PDRD	YES		SHMS requires purge nitrogen. If the purge gas is switched to instrument air, there will be an air quality issue.
SY.14.3	CHEMICAL COMPOSITION INSTRUMENTATION	3.2.1.1.1.1 3.2.1.1.2.1.1 3.2.1.1.1.2.1.2	PDRD	NO	I. See the Engineering Analysis.	An installed chemical analyzer does not exist. This is a manual effort, analysis is by laboratory & is infrequently done. The PDRD should clarify the sampling frequency for each data type.

**EXISTING TANK FARM EQUIPMENT
FUNCTIONS ASSESSMENT TABLE**
INSTRUMENTS & CONTROL SYSTEMS

REF. NO.	SYSTEM NAME	FUNCTION OR CONSTRAINT			METHOD OF ANALYSIS I. Analysis II. Inspection III. Testing	BRIEF REASON FOR DECISION
		DESCRIPTION	SOURCE	MET		
SY.14.3.1	SPECIFIC GRAVITY INSTRUMENTATION	3.2.1.1.1.2.1.2	PDRD	NO	I. See the Engineering Analysis. IIa. See Field Inspection Questionnaire. IIb. See CAS Data Sheets.	This equipment is obsolete. Acquisition of spare parts in the future may be difficult. The length of time that Manufacture support will be available is uncertain. The SpG system has been inoperative in all three tanks until recently. Density is not measured directly, but is calculated from air pressure measurements. This complicates the calibration function. Better instrumentation exists which does not use instrument air. There is the instrument air quality issue which may render the system unreliable. The PDRD should reassess the need for a real time monitoring instrument system.
SY.14.4	TANK LIQUID SURFACE LEVEL INSTRUMENTATION	3.2.1.1.1.5 3.2.1.1.1.13 3.2.1.1.2.12	PDRD	YES	I. See the Engineering Analysis	This gauge provides the functionality required by the PDRD. It may require reassessment when the RAS data sheets are approved.
SY.14.4.5	Remote Computer Digital Interface(s)	3.2.1.1.1.1.13	PDRD	NO	I. See the Engineering Analysis.	The ENRAF CJU will be required to transmit data to TMACS in order to obtain a full sensor data range (top tank level to bottom of tank).
SY.14.5	SLUDGE WEIGHT (LEVEL) MONITORING	3.2.1.1.1.1	PDRD	YES	I. See the Engineering Analysis.	This device is expensive to fabricate. It requires an Operator to enter the farm to operate. The level data obtained is subject to Operator interpretation and the resolution is poor. A Trade Study should determine if this device should be automated.
SY.14.6	101-SY GAS MONITORING INSTRUMENTATION					Not assessed
SY.14.7	TANK SURFACE VIDEO MONITORING SYSTEM(S)	Not in PDRD				This function is missing from the PDRD and should be added.
SY.14.7.1	In-Tank Camera Subsystem (SY.101)					Not assessed
SY.14.7.2	Video Display Subsystem (DACS Trailer)					Not assessed

**EXISTING TANK FARM EQUIPMENT
FUNCTIONS ASSESSMENT TABLE**
INSTRUMENTS & CONTROL SYSTEMS

REF. NO	SYSTEM NAME	FUNCTION OR CONSTRAINT			METHOD OF ANALYSIS I. Analysis II. Inspection III. Testing	BRIEF REASON FOR DECISION
		DESCRIPTION	SOURCE	MET		
SY.15	TANK CONTENTS MIXING SYSTEMS	Not in PORD				This function is missing from the PORD and should be added.
SY.15.1	AIR LIFT CIRCULATOR CONTROL SYSTEM					
SY.15.1.1	DIFF. PRESSURE SENSORS				I. See the Engineering Analysis. IIa. See Field Inspection Questionnaire. IIb. See CAS Data Sheets.	These sensors are manually read. A Trade Study should determine if the data acquisition should be automated.
SY.15.2	MIXING PUMP SYSTEM	Not in PORD				
SY.15.2.1	Pump Sensors (Temperatures, Strains, Pressures, Positions)					Not assessed
SY.15.2.2	Pump Rotation Variable Speed Drive controller (SY-271)					Not assessed
SY.15.2.3	Pump Impeller Variable Speed Controller (SY-271)					Not assessed
SY.15.2.4	Modicon Interface (Mix. Pump Instr. Cab.)					Not assessed
SY.15.2.5	Mixer Pump (SY-101)					Not assessed
SY.16	SCC STATUS/MONITORING SYSTEM AC POWER SUPPLY STATUS AIR SUPPLY STATUS WATER SUPPLY STATUS HEAT TRACE SYS. STATUS CATHODIC PROTECTION SYSTEM STATUS	3.2.1.1.2.1 3.2.1.1.2.3	PORD	NO	I. See the Engineering Analysis. IIa. See Field Inspection Questionnaire. IIb. See CAS Data Sheets.	A status summary alarm panel for all these subsystems doesn't exist. Some status are available on the old PANALARM panels. Some of the data is obtained by Operators on rounds.
SY.16.4	TANK CONCRETE STRUCTURE TEMPERATURE INST.	3.2.1.1.1.29 3.2.1.2.1.1.2	PORD	NO	I. See the Engineering Analysis. IIa. See Field Inspection Questionnaire. IIb. See CAS Data Sheets.	The Data Loggers are obsolete. Spare parts procurement is a problem.

EXISTING TANK FARM EQUIPMENT FUNCTIONS ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS						
REF. NO	SYSTEM NAME	FUNCTION OR CONSTRAINT			METHOD OF ANALYSIS I. Analysis II. Inspection III. Testing	BRIEF REASON FOR DECISION
		DESCRIPTION	SOURCE	MET		
SY.17	HEAT TRACE CONTROL SYSTEM	3.2.1.3	PDRD	NO	I. See the Engineering Analysis. IIa. See Field Inspection Questionnaire. IIb. See CAS Data Sheets.	Many of the Transfer Lines have broken heat traces. The PDRD should reassess the need for this system and identify the pipelines that require this function.
SY.18	CATHODIC PROTECTION CONTROL SYSTEM	3.2.1.3.5 Testing Requirement	PDRD WAD-173-303#640	NO	I. See the Engineering Analysis. IIa. See Field Inspection Questionnaire. IIb. See CAS Data Sheets.	The existing system doesn't seem to comply with the testing capability requirements for cathodic protection systems i.a.w. WAC. On line instrumentation to indicate the operation of the system is poor or non-existent.

8.3 Architecture Tree Tables

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Level 3

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Level 3

Level 4

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Level 3

Level 4

Level 5

Level 2

Level 3

Level 4

Level 5

Level 2

Level 3

Level 4

Level 2

LEAK CONTROL
SYSTEM
SY.11

Level 3

ANNULUS LEAK
INSTRUMENTATION
SY.11.2

Level 4

CAM Radiation
Monitoring
Subsystem
SY.11.2.1

1 Subsystem per tank

Level 5

Air Sampler
Probe/Tubing/etc
SY.11.2.1.1

Radiation
Analyzer
SY.11.2.1.2

Cabinet
(at ea. tank)
SY.11.2.1.3

1-Pen Recorder
& Alarms
(SY-271,
242-S)
SY.11.2.1.4

Signal
Wiring/Conduit
SY.11.2.1.5

Level 2

Level 3

Level 4

Level 2

Level 3

Level 4

Level 5

Level 2

Level 3

Level 4

Level 2

Level 2

Level 3

Level 4

(Alarmed only)

Level 4

Level 2

Level 3

Level 4

Level 5

Level 2

VENTILATION
CONTROL SYSTEM
SY.12

Level 3

TANK PRIMARY
VENTILATION
SYSTEM
SY.12.1

Level 4

Regulated Stack
Monitoring
System
SY.12.1.8

Level 5

Tubing from Stack
to CAM
SY.12.1.8.1

CAMs
SY.12.1.8.2

CAM Cabinets
SY.12.1.8.3

Vacuum Pumps
SY.12.1.8.4

p-Pap
Recorder
(242-S)
SY.12.1.8.5

Level 2

Level 3

Level 4

Level 2

Level 2

Level 2

Level 3

Level 4

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Level 3

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Level 3

(out of service)

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8.4 Drawing Reference Tables

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EXISTING TANK FARM EQUIPMENT SYSTEM DRAWING REFERENCES INSTRUMENTS & CONTROL SYSTEMS				
REF NO.	SYSTEM NAME	DRAWING REFERENCES	NO. OF ECNs OUTSTANDING	PDRD REFERENCE
SY.11	LEAK CONTROL SYSTEM	H-2-37757	0	1. 3.2.1.1.2.4
SY.11.1	LEAK DET. PIT/SUMP INST.	H-2-37757	0	
SY.11.1.1	Gamma Radiation Monitoring Subsystem	H-2-37757	0	1. 3.2.1.1.1.17
SY.11.1.1.1	Gamma Probe Well Structure	H-2-37757, H-2-37787	0	
SY.11.1.1.2	Gamma Probe & Well Cable	H-2-37757, H-2-37845	0	
SY.11.1.1.3	Field Signal Cable	H-2-37757	0	
SY.11.1.1.4	reserved			
SY.11.1.1.5	Log Alarm Count Rate Meters/ Alarm comparators.	H-2-37758	0	
SY.11.1.2	Weight Factor & Specific Gravity Monitoring Subsystem	H-2-37757	0	1. 3.2.1.1.1.17
SY.11.1.2.1	Sample Tubes (Leak Det. Pits)	H-2-37757, H-2-37763	0	
SY.11.1.2.2	Weight Factor & Specific Gravity Pressure Sensors	H-2-37757, H-2-37763	0	
SY.11.1.2.3	Weight Factor Cabinet (Xmitter Enclosure)	H-2-37757, H-2-37763	0	
SY.11.1.2.4	Field Tubing	H-2-37757, H-2-37763	0	
SY.11.1.2.5	W.F. & SpG Pressure Switches & Indicators (Inst. Panel & Press SW Rack)	H-2-37757, H-2-37846	0	
SY.11.1.3	Liquid Presence Sensor and Buried wiring	H-2-37757	0	1. 3.2.1.1.1.17
SY.11.1.4	Liquid Temperature Sensor	H-2-37757, 37845	0	1. 3.2.1.1.1.17
SY.11.2	ANNULUS LEAK INSTRUMENTATION	H-2-37757	0	1. Secondary Containment Leak Detection
SY.11.2.1	Annulus CAM Radiation Monitoring Subsystem	H-2-37756	0	1. 3.2.1.1.1.17
SY.11.2.1.1	Air Sampler Probe/ Tubing/ etc	H-2-37756	0	

EXISTING TANK FARM EQUIPMENT SYSTEM DRAWING REFERENCES INSTRUMENTS & CONTROL SYSTEMS				
REF NO.	SYSTEM NAME	DRAWING REFERENCES	NO. OF ECNs OUTSTANDING	PDRD REFERENCE
SY.11.2.1.2	Radiation Analyzer	H-2-37756	0	
SY.11.2.1.3	Cabinets (at each tank)	H-2-37756	0	
SY.11.2.1.4	1-Pen recorder & Alarms (SY-271 & 242-S)	H-2-37758	0	
SY.11.2.1.5	Signal Wiring/ Conduit	H-2-37732	2	
SY.11.2.2	Liquid Presence Sensor (Flake Box & Manual Tape Conductivity Probe)	H-2-37757	0	1. 3.2.1.1.1.17
SY.11.2.3	Annulus Pump Pit Liquid Presence Sensor	H-2-37757	0	
SY.11.3	PIPELINE LEAK INSTRUMENTATION			1. 3.2.1.1.2.7 2. Secondary Containment Leak Detection
SY.11.3.1	C.O.B. Liquid Presence Sensor	H-2-37791, H-2-34965	0	1. 3.2.1.1.2.7
SY.11.3.2	Pipeline Pressure Switch Sensor	N/A		1. 3.2.1.1.2.10 2. 3.2.1.3.4
SY.11.3.3	Transfer Pits: Liquid Presence Sensor (Feed Pump Pit, Valve Pits, Central Pump Pits, Flush Pit, Drain Pit)	H-2-37757	0	1. 3.2.1.1.2.7
SY.11.3.3.1	Pit Liquid Presence Sensor	H-2-34965	0	1. 3.2.1.1.2.7
SY.11.3.3.2	Pit Pressure Switch(s)	N/A		1. 3.2.1.1.2.10 2. 3.2.1.3.4
SY.11.3.3.3	Signal Wiring/Conduit/Terminal Boxes	H-2-37732	2	
SY.11.3.4	Signal Wiring/ Conduit/ Terminal Boxes	H-2-37732	2	
SY.11.3.5	Service Pit Instrumentation (LDE only)	H-2-37757	0	
SY.11.4	PUMP PERMISSIVE INSTRUMENTATION (Master Pump shutdown)	H-2-37735	0	1. 3.2.1.1.2.9 2. 3.2.1.1.2.10 3. 3.2.1.3.10
SY.11.4.1	241-SY-271 Master Pump Shutdown Relay Panel	H-2-37735	0	1. 3.2.1.1.2.9 2. 3.2.1.1.2.10 3. 3.2.1.3.10

EXISTING TANK FARM EQUIPMENT SYSTEM DRAWING REFERENCES INSTRUMENTS & CONTROL SYSTEMS				
REF NO.	SYSTEM NAME	DRAWING REFERENCES	NO. OF ECNs OUTSTANDING	PRDR REFERENCE
SY.11.4.2	MPS Pushbutton Control Panel (242-S)			
SY.11.4.3	Signal Wiring/Conduit/Terminal Boxes			
SY.11.4.4	[242-S MPS Relay Panel]			
SY.11.5	LOCAL ALARM ANNUNCIATION & ALARM PANELS	H-2-37758, H-2-37761	0	1. 3.2.1.1.2.2 2. 3.2.1.1.2.3 3. 3.2.1.1.2.4 4. 3.2.1.1.2.5 5. 3.2.1.1.2.13 6. 3.2.1.1.3
SY.11.5.1	Alarm Panel in 241-SY-271	H-2-37758, H-2-37761	0	
SY.11.5.2	Local Tank Farm Alarm Panel	H-2-37761, H-2-37847	0	
SY.11.5.3	[242-S Alarm Panels]	H-2-37847	0	
SY.11.6	REMOTE ALARM SIGNALING (GAMEWELL LOOP)	H-2-71804, H-2-71805	0	3.2.1.1.3
SY.12	VENTILATION CONTROL SYSTEM	H-2-37744, H-2-37732	2	
SY.12.1	TANK PRIMARY VENTILATION SYSTEM	H-2-37734 (NOTE - BEING UPGRADED)	3	
SY.12.1.1	Tank Diff. Pressure Inst. Subsystem	H-2-37757	0	1. 3.2.1.1.1.33 2. 3.2.1.1.1.34 3. 3.2.1.1.1.35
SY.12.1.1.1	Tank Riser Tubing to Pressure Sensor/Transmitter	H-2-37763	0	
SY.12.1.1.2	Pressure Sensor Transmitters	H-2-37757, H-2-37763	0	
SY.12.1.1.3	Field Instrument Air Tubing	H-2-37763	0	
SY.12.1.1.4	Pressure Switch/Alarm	H-2-37846	0	
SY.12.1.1.5	2-Pen Pressure Recorders (241-SY-271)	H-2-37758	0	
SY.12.1.2	HEPA Filter Diff. Pressure Instr.	H-2-37744	0	
SY.12.1.3	Temperature Instrumentation	H-2-37744	0	1. 3.2.1.1.1.41
SY.12.1.4	Heater Control Subsystem	H-2-37744	0	

EXISTING TANK FARM EQUIPMENT SYSTEM DRAWING REFERENCES INSTRUMENTS & CONTROL SYSTEMS				
REF NO.	SYSTEM NAME	DRAWING REFERENCES	NO. OF ECNs OUTSTANDING	PCRD REFERENCE
SY.12.1.5	Fan-Motor Control Subsystem	H-2-37744, H-2-37732	2	
SY.12.1.6	Damper Control Subsystem	N/A - MANUAL		
SY.12.1.7	Moisture Monitoring Subsystem			3.2.1.1.1.4.2
SY.12.1.8	Regulated Stack Monitoring System (296-A-27)	H-2-93427	5	1. 3.2.1.1.1.4.2
SY.12.1.8.1	Tubing from Stack to CAM	H-2-93426	0	
SY.12.1.8.2	CAM Radiation Analyzer	H-2-93427	5	
SY.12.1.8.3	CAM Cabinets	H-2-93427	5	
SY.12.1.8.4	Vacuum Pumps	H-2-93427	5	
SY.12.1.8.5	2-Pen Recorder (242-S)	H-2-37758	0	
SY.12.2	TANK ANNULUS VENTILATION SYSTEM	H-2-37744	0	
SY.12.2.1	Annulus Diff. Pressure Inst. System	H-2-37757	0	3.2.1.2.3.1
SY.13	TRANSFER LINE CONTROL SYSTEM			1. 3.2.1.1.2.5 2. 3.2.1.1.2.8
SY.13.1	PUMP CONTROL SUBSYSTEM	H-2-37735	0	1. 3.2.1.1.2.9
SY.13.2	VALVE POSITION INSTRUMENTATION/ INDICATION (No automation)	N/A - MANUAL		1. 3.2.1.1.2.10
SY.13.3	VALVE CONTROL SYSTEM (DOV in flush Pit)			1. 3.2.1.1.2.10
SY.13.4	PRESSURE SWITCH INSTRUMENTATION (Flow Indication) (Flush Pit)			1. 3.2.1.1.2.9
SY.13.5	WASTE FLOW MONITORING INSTRUMENTATION (Service Pit & Flush Pit)	H-2-70835	1	1. 3.2.1.1.2.11
SY.13.5.1	Service Pit Instrument Subsystems	H-2-70835	1	
SY.13.5.1.1	Flow Monitor & Totalizer	H-2-70835	1	
SY.13.5.1.2	Radiation (Gamma) Monitor	H-2-37758	0	

EXISTING TANK FARM EQUIPMENT SYSTEM DRAWING REFERENCES INSTRUMENTS & CONTROL SYSTEMS				
REF NO.	SYSTEM NAME	DRAWING REFERENCES	NO. OF ECNs OUTSTANDING	PDRD REFERENCE
SY.13.5.1.3	Pipeline Pressure	H-2-70835	1	
SY.14	TANK CONTENTS MONITORING SYSTEM			1. 3.2.1.1.2.5
SY.14.1	TEMPERATURE/VAPOR INSTRUMENTATION	H-2-37757	0	1. 3.2.1.1.1.9 2. 3.2.1.1.1.25 3. 3.2.1.2.1.1.1
SY.14.1.1	Thermocouple Probes	H-2-37757, H-2-37762	2	
SY.14.1.2	Multifunction Instrument Trees	H-2-85123, H-2-89468	1	
SY.14.1.3	Temperature Vapor Probes (velocity-Density Tree?)	RETIRED IN PLACE		
SY.14.2	STANDARD HYDROGEN MONITORING SYSTEM	H-2-85100, H-2-87275	14	1. 3.2.1.1.1.37
SY.14.2.1	Gas Flow Instrumentation	H-2-87276, H-2-87279, H-2-817851, H-2-817853	3	
SY.14.2.2	H2 Concentration Low Range Instrumentation	H-2-87276, H-2-87279, H-2-817851, H-2-817853	3	
SY.14.2.3	H2 Concentration High range Instrumentation	H-2-87276, H-2-87279, H-2-817851, H-2-817853	3	
SY.14.2.4	Gas Temperature Instrumentation	H-2-87276, H-2-87279, H-2-817851, H-2-817853	3	
SY.14.2.5	3 Pen Recorder	H-2-87276, H-2-87279, H-2-817851, H-2-817853	3	
SY.14.3	CHEMICAL COMPOSITION INSTRUMENTATION			1. 3.2.1.1.1.1 2. 3.2.1.1.1.2.1.1 3. 3.2.1.1.1.2.1.2
SY.14.3.1	SPECIFIC GRAVITY INSTRUMENTATION	REMOVED		1. 3.2.1.1.1.2.1.2
SY.14.3.1.1	SY-101 Specific Gravity Instrumentation	REMOVED		
SY.14.3.1.2	SY-102 Specific Gravity Instrumentation	REMOVED		
SY.14.3.1.3	SY-103 Specific Gravity Instrumentation	REMOVED		
SY.14.4	TANK LIQUID SURFACE LEVEL INSTRUMENTATION	H-2-37757	0	1. 3.2.1.1.1.5 2. 3.2.1.1.1.13 3. 3.2.1.1.2.1.2
SY.14.4.1	Enraf Riser Extension	H-2-817634	21	

EXISTING TANK FARM EQUIPMENT SYSTEM DRAWING REFERENCES INSTRUMENTS & CONTROL SYSTEMS				
REF. NO.	SYSTEM NAME	DRAWING REFERENCES	NO. OF ECNs OUTSTANDING	PDRD REFERENCE
SY14.4.2	Enraf Boumacy-Tension Level Sensor	H-2-817634	21	
SY14.4.3	Enraf Radar Gauge	H-2-92999	2	
SY14.4.4	Enraf Signal Cable, Terminal Boxes	H-2-817634	21	
SY14.4.5	Remote Computer Digital Interface(s)	H-2-92999	2	
SY14.5	SLUDGE WEIGHT (LEVEL) MONITORING	H-2-37757	0	
SY14.6	101-SY GAS MONITORING INSTRUMENTATION	H-2-815208, H-2-815220	1	
SY14.7	TANK SURFACE VIDEO MONITORING SYSTEM(S)			
SY14.7.1	In-Tank Camera Subsystem (SY-101)	H-2-83074, H-2-822805		
SY14.7.2	Video Display Subsystem (DACS Trailer)			
SY14.7.3	DACS Control Room	Doesn't exist - see CVI file		
SY15	TANK CONTENTS MIXING SYSTEMS			
SY15.1	AIR LIFT CIRCULATOR CONTROL SYSTEM	H-2-37757 (102-SY ONLY)	0	
SY15.1.1	DIFF. PRESSURE SENSORS	H-2-37757	0	
SY15.1.2	LOCAL ALARM INDICATION	N/A		
SY15.2	MIXING PUMP SYSTEM	H-2-89967	1	
SY15.2.1	Pump Sensors (Temperatures, Strains, Pressures, Positions)	H-2-89967	1	
SY15.2.2	Pump Rotation Variable Speed Drive controller (SY-271)	H-2-815171	1	
SY15.2.3	Pump Impeller Variable Speed Controller (SY- 271)	H-2-815171	1	
SY15.2.4	Modicon Interface (Mix. Pump Instr. Cab.)	H-2-815171	1	
SY15.2.5	Mixer Pump (SY-101)	H-2-89967	1	

EXISTING TANK FARM EQUIPMENT SYSTEM DRAWING REFERENCES INSTRUMENTS & CONTROL SYSTEMS				
REF NO.	SYSTEM NAME	DRAWING REFERENCES	NO. OF ECNs OUTSTANDING	PDRD REFERENCE
SY.16	SCC STATUS/MONITORING SYSTEM			1. 3.2.1.1.2.1 2. 3.2.1.1.2.3
SY.16.1	AC POWER SUPPLY STATUS INST.	H-2-37734	3	
SY.16.2	AIR SUPPLY STATUS INST.			
SY.16.3	WATER SUPPLY STATUS INST.			
SY.16.4	TANK CONCRETE STRUCTURE TEMPERATURE INST.	H-2-37757	0	1. 3.2.1.1.1.29 2. 3.2.1.2.1.1.2
SY.16.4.1	Data Logger (See CASS Assessment)			
SY.16.4.2	Manual Readout Panel	H-2-37758	0	
SY.16.4.3	Signal Wiring/Terminal Boxes	H-2-37762, H-2-37764	12	
SY.16.5	HEAT TRACE SYSTEM STATUS INST.	H-2-37733	1	
SY.16.6	CATHODIC PROTECTION SYSTEM STATUS INST.			
SY.17	HEAT TRACE CONTROL SYSTEM	H-2-37733	1	1. 3.2.1.3
SY.17.1	TEMPERATURE MONITORING SENSORS	H-2-37733	1	
SY.17.2	TEMP. CONTROLLER SUBSYSTEM	H-2-37733	1	
SY.17.3	OVER TEMP. CONTROLLER SUBSYSTEM	H-2-37733	1	
SY.17.4	HEATER CONTACTOR - OTHER WIRING	H-2-37733	1	
SY.17.5	PIPELINE HEAT TRACE TAPE HEATERS	H-2-37733	1	
SY.18	CATHODIC PROTECTION CONTROL SYSTEM	H-2-91017 THRU H-2-91029	1	1. 3.2.1.3.5 2. Testing Requirement
SY.18.1	POWER CONTROLLER	H-2-91017 THRU H-2-91029	1	
SY.18.2	WIRING/CONDUIT	H-2-91017 THRU H-2-91029	1	

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8.5 Special Testing

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8.6 Field Assessment Questionnaire

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EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT QUESTIONNAIRE INSTRUMENTS & CONTROL SYSTEMS				
REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS		FINDINGS
		DESCRIPTION		
SY-11	LEAK CONTROL SYSTEM			
SY-11.1	LEAK DET. PIT/SUMP INST.			
SY-11.1.1	Gamma Radiation Monitoring Subsystem			
SY-11.1.1.1	Gamma Probe Well Structure	Inspect equipment and cabinets/terminal boxes for corrosion. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.		1) Cover plate is not sealed and water accumulates in well from infiltration and condensation.
SY-11.1.1.2	Gamma Probe & Well Cable	Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.		1) Coaxial cable is subject to failure from excessive moisture.
SY-11.1.1.3	Field Signal Cable	Inspect instrument cables where accessible.		
SY-11.1.1.4				
SY-11.1.1.5	Log Alarm Count Rate Meters/ Alarm comparators.	Inspect instrument cables where accessible. Inspect wiring where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.		1) Estimated age of equipment: 15 years. 2) Equipment is removed for shop calibration at 6 month intervals.
SY-11.1.2	Weight Factor & Specific Gravity Monitoring Subsystem			1) The instrument air supply for SY farm has recently been upgraded (2 years), but previously supplied wet, dirty, air.
SY-11.1.2.1	Sample Tubes (Leak Det. Pits)	Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.		1) Good condition.

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT QUESTIONNAIRE INSTRUMENTS & CONTROL SYSTEMS			
REF. NO.	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS	
		DESCRIPTION	
SY.11.1.2.2	<i>Weight Factor & Specific Gravity Pressure Sensors</i>	Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	1) Estimated age of equipment is 15 years 2) Appear to be in good condition
SY.11.1.2.3	<i>Weight Factor Cabinet (Xmitter Enclosure)</i>	Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	1) Cabinet doors do not seal properly allowing dirt to infiltrate the cabinet. 2) Climate control not very effective - resistance heater which sometimes does not work in winter, no cooling capacity for summer heat.
SY.11.1.2.4	<i>Field Tubing</i>	Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	1) Tubing is routed in buried conduit from remote cabinets to 271-S 2) Tubing appears to be in good condition but has been filled with water and debris from previous instrument air systems
SY.11.1.2.5	<i>W.F. & SpG Pressure Switches & Indicators (Inst. Panel & Press SW Rack)</i>	Inspect wiring where accessible. Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	1) Estimated age of equipment is 15 years 2) Low repair rate 3) Calibration on annual rotation, performed in the field at 1 hour per instrument 4) No recurrent problems
SY.11.1.3	<i>Liquid Presence Sensor and Buried wiring</i>	Inspect wiring where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	1) Equipment is not available for inspection.

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT QUESTIONNAIRE INSTRUMENTS & CONTROL SYSTEMS			
REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS	
		DESCRIPTION	
SY.II.1.4	Liquid Temperature Sensor		1) Equipment has been connected to TMACS 2) Thermocouple wires are 15 years old and many of the sensors have failed
SY.II.2	ANNULUS LEAK INSTRUMENTATION		Leak detection is provided by three separate systems: 1) Continuous air monitor 2) Continuity probe 3) Flame Box (manual tape)
SY.II.2.1	CAM Radiation Monitoring Subsystem (1 subsystem per tank)		
SY.II.2.1.1	<i>Air Sampler Probe/ Tubing/ etc</i>	Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	1) Probe could not be accessed at this time. Tubing has no signs of corrosion or damage.
SY.II.2.1.2	<i>Radiation Analyzer</i>	Inspect instrument cables where accessible. Inspect wiring where accessible. Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	1) Estimated age of equipment is 15 years 2) Low repair rate 3) Calibration is on an annual rotation, performed in the shop at 8 hours per instrument.
SY.II.2.1.3	<i>Cabinets (at each tank)</i>	Inspect wiring where accessible. Inspect instrument tubing where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.	1) Doors do not fit properly allowing dust infiltration 2) Poor climate control - hot in summer and cold in winter

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT QUESTIONNAIRE INSTRUMENTS & CONTROL SYSTEMS				
REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS		FINDINGS
		DESCRIPTION		
SY.11.2.1.4	1-Pen recorder & Alarms (SY-271 & 242-S)	Inspect instrument cables where accessible. Inspect wiring where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Estimate maintenance repair frequency for equipment. Determine method of calibration and determine if equipment can be calibrated. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.		1) Recorders in 242-S recently upgraded to current industry standard 2) Recorders in 271-S are 15 years old 3) Alarms are relayed off of field sensor
SY.11.2.1.5	Signal Wiring/ Conduit	Inspect wiring where accessible. Inspect equipment and cabinets/terminal boxes for corrosion. Estimate age of equipment. Determine known continuous problems (operating or maintenance) with the equipment. Take photographs of equipment to illustrate problem areas.		1) Signal wiring is in good condition but is not well marked or documented for tracing.
SY.11.2.2	Liquid Presence Sensor (Flake Box & Manual Tape Conductivity Probe)			1) Estimated Age of equipment is 15 years 2) Repair rate varies (moisture problems and broken tapes) 3) No calibration is performed. A functional test is performed monthly 4) Terminal boxes exhibited a presence of condensation at all of the Flake boxes. O-ring seals are frequently replaced. a large volume of purge air is used at each Flake box. Recommend replacement with ENRAF series 854 for remote access.
SY.11.3	PIPELINE LEAK INSTRUMENTATION			
SY.11.3.1	C.O.B. Liquid Presence Sensor	1. Inspect wiring where accessible. 2. Inspect equipment and cabinets/terminal boxes for corrosion. 3. Estimate age of equipment. 4. Estimate maintenance repair frequency for equipment. 5. Determine method of calibration and determine if equipment can be calibrated. 6. Determine known continuous problems (operating or maintenance) with the equipment. 7. Take photographs of equipment to illustrate problem areas.		1) Estimated age 15 years 2) No Calibration - Function tests performed monthly or bimonthly.

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT QUESTIONNAIRE INSTRUMENTS & CONTROL SYSTEMS			
REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS	FINDINGS
		DESCRIPTION	
SY.11.3.2	Pipeline Pressure Switch Sensor	<ol style="list-style-type: none"> 1. Inspect wiring where accessible. 2. Inspect equipment and cabinets/terminal boxes for corrosion. 3. Estimate age of equipment. 4. Estimate maintenance repair frequency for equipment. 5. Determine method of calibration and determine if equipment can be calibrated. 6. Determine known continuous problems (operating or maintenance) with the equipment. 7. Take photographs of equipment to illustrate problem areas. 	<ol style="list-style-type: none"> 1) Pressure switches in pit 2) Not accessible for maintenance
SY.11.3.3	Transfer Pits; Liquid Presence Sensor (Feed Pump Pit, Valve Pits, Central Pump Pits, Flush Pit, Drain Pit)	<ol style="list-style-type: none"> 1. Inspect instrument cables where accessible. 2. Inspect wiring where accessible. 3. Inspect instrument tubing where accessible. 4. Inspect equipment and cabinets/terminal boxes for corrosion. 5. Estimate age of equipment. 6. Estimate maintenance repair frequency for equipment. 7. Determine method of calibration and determine if equipment can be calibrated. 8. Determine known continuous problems (operating or maintenance) with the equipment. 9. Take photographs of equipment to illustrate problem areas. 	<ol style="list-style-type: none"> 1) Require frequent maintenance 2) No calibration possible.
SY.11.3.3.1	Pit Liquid Presence Sensor	<ol style="list-style-type: none"> 1. Inspect wiring where accessible. 2. Inspect equipment and cabinets/terminal boxes for corrosion. 3. Estimate age of equipment. 4. Estimate maintenance repair frequency for equipment. 5. Determine method of calibration and determine if equipment can be calibrated. 6. Determine known continuous problems (operating or maintenance) with the equipment. 7. Take photographs of equipment to illustrate problem areas. 	<ol style="list-style-type: none"> 1) Access not allowed at this time
SY.11.3.3.2	Pit Pressure Switch(s)	<ol style="list-style-type: none"> 1. Inspect wiring where accessible. 2. Estimate age of equipment. 3. Estimate maintenance repair frequency for equipment. 4. Determine method of calibration and determine if equipment can be calibrated. 5. Determine known continuous problems (operating or maintenance) with the equipment. 6. Take photographs of equipment to illustrate problem areas. 	<ol style="list-style-type: none"> 4) Calibration not possible due to access limitations.
SY.11.3.3.3	Signal Wiring/Conduit/Terminal Boxes	<ol style="list-style-type: none"> 6. Take photographs of equipment to illustrate problem areas. 	<ol style="list-style-type: none"> 1) Wiring at terminal boxes in the 241SY farms need to be replaced. Wire insulation is brittle and cracked. 2) Current sensitive relays are not calibrated. Functional tests are performed by the electricians and relays are replaced as they fail.

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT QUESTIONNAIRE INSTRUMENTS & CONTROL SYSTEMS			
REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS	FINDINGS
		DESCRIPTION	
SY.II.3.4	Signal Wiring/ Conduit/ Terminal Boxes	1. Inspect wiring where accessible. 2. Inspect equipment and cabinets/terminal boxes for corrosion. 3. Take photographs of equipment to illustrate problem areas.	
SY.II.3.5	Service Pit Instrumentation (Flow, Radiation, Press, SW)		
SY.II.4	PUMP PERMISSIVE INSTRUMENTATION (Master Pump shutdown)		
SY.II.4.1	241-SY-271 Master Pump Shutdown Relay Panel	1. Inspect wiring where accessible. 2. Inspect equipment and cabinets/terminal boxes for corrosion. 3. Estimate age of equipment. 4. Estimate maintenance repair frequency for equipment. 5. Determine known continuous problems (operating or maintenance) with the equipment. 6. Take photographs of equipment to illustrate problem areas.	1) Wiring is in good condition within relay panel 3) Estimated age of equipment is 15 years 4) Maintenance history unknown. 5) Prints need to be updated for better reliability of maintenance.
SY.II.4.2	MPS Pushbutton Control Panel (242-S)		1) See 1.4.1
SY.II.4.3	Signal Wiring/Conduit/Terminal Boxes		1) Estimated age 15 years 2) The integrity of the weather tight boxes has been compromised by drilling weep holes of by the use of non-weather tight fittings on the conduit
SY.II.4.4	242-S MPS Relay Panel	1. Inspect wiring where accessible. 2. Inspect equipment and cabinets/terminal boxes for corrosion. 3. Estimate age of equipment. 4. Take photographs of equipment to illustrate problem areas.	1) Estimated age 15 years
SY.II.5	LOCAL ALARM ANNUNCIATION & ALARM PANELS		
SY.II.5.1	Alarm Panel in 241-SY-271	1. Inspect wiring where accessible. 2. Inspect equipment and cabinets/terminal boxes for corrosion. 3. Estimate age of equipment. 4. Estimate maintenance repair frequency for equipment. 5. Take photographs of equipment to illustrate problem areas.	1) Wiring is in good condition within building 271.

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT QUESTIONNAIRE INSTRUMENTS & CONTROL SYSTEMS				
REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS		FINDINGS
		DESCRIPTION		
SY.11.5.2	Local Tank Farm Alarm Panel	1. Inspect wiring where accessible. 2. Inspect equipment and cabinets/terminal boxes for corrosion. 3. Estimate age of equipment. 4. Estimate maintenance repair frequency for equipment. 5. Take photographs of equipment to illustrate problem areas.		1) Estimated age of equipment is 15 years
SY.11.5.3	24/2-S Alarm Panels			1) Estimated age of equipment varies from new to 15 years.
SY.11.6	REMOTE ALARM SIGNALING (GAMEWELL LOOP)	1. Inspect instrument cables where accessible. 2. Inspect wiring where accessible. 3. Inspect instrument tubing where accessible. 4. Inspect equipment and cabinets/terminal boxes for corrosion. 5. Estimate age of equipment. 6. Estimate maintenance repair frequency for equipment. 7. Determine method of calibration and determine if equipment can be calibrated. 8. Determine known continuous problems (operating or maintenance) with the equipment. 9. Take photographs of equipment to illustrate problem areas.		This system is being upgraded to new system with industry standard remote reporting features.
SY.12	VENTILATION CONTROL SYSTEM			
SY.12.1	TANK PRIMARY VENTILATION SYSTEM			
SY.12.1.1	Tank Diff. Pressure Inst. Subsystem			
SY.12.1.1.1	Tank Riser Tubing to Pressure Sensor/Transmitter	1. Inspect instrument tubing where accessible. 2. Inspect equipment and cabinets/terminal boxes for corrosion. 3. Estimate age of equipment. 4. Estimate maintenance repair frequency for equipment. 5. Take photographs of equipment to illustrate problem areas.		1) Good condition
SY.12.1.1.2	Pressure Sensor-Transmitters	1. Inspect wiring where accessible. 2. Inspect instrument tubing where accessible. 3. Inspect equipment and cabinets/terminal boxes for corrosion. 4. Estimate age of equipment. 5. Estimate maintenance repair frequency for equipment. 6. Determine method of calibration and determine if equipment can be calibrated. 7. Determine known continuous problems (operating or maintenance) with the equipment. 8. Take photographs of equipment to illustrate problem areas.		1) No remote readout capability

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT QUESTIONNAIRE INSTRUMENTS & CONTROL SYSTEMS			
REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS	FINDINGS
		DESCRIPTION	
SY.12.1.1.3	<i>Field Instrument Air Tubing</i>	<ol style="list-style-type: none"> 1. Inspect instrument tubing where accessible. 2. Inspect equipment and cabinets/terminal boxes for corrosion. 3. Estimate age of equipment. 4. Determine known continuous problems (operating or maintenance) with the equipment. 5. Take photographs of equipment to illustrate problem areas. 	<ol style="list-style-type: none"> 1) Instrument tubing was not installed with maintenance of the instrumentation in mind.
SY.12.1.1.4	<i>Pressure Switch/Alarm</i>	<ol style="list-style-type: none"> 1. Inspect wiring where accessible. 2. Inspect instrument tubing where accessible. 3. Inspect equipment and cabinets/terminal boxes for corrosion. 4. Estimate age of equipment. 5. Estimate maintenance repair frequency for equipment. 6. Determine method of calibration and determine if equipment can be calibrated. 7. Determine known continuous problems (operating or maintenance) with the equipment. 8. Take photographs of equipment to illustrate problem areas. 	<ol style="list-style-type: none"> 4) Estimated age of equipment is 15 years 5) Low repair rate 6) Calibration on annual rotation. Performed in the field at 1 hour per instrument. Requires system switchover to verify interlocks.
SY.12.1.1.5	<i>2-Pen Pressure Recorders (241-SY-271)</i>	<ol style="list-style-type: none"> 1. Inspect instrument cables where accessible. 2. Inspect wiring where accessible. 3. Inspect equipment and cabinets/terminal boxes for corrosion. 4. Estimate age of equipment. 5. Estimate maintenance repair frequency for equipment. 6. Determine method of calibration and determine if equipment can be calibrated. 7. Determine known continuous problems (operating or maintenance) with the equipment. 8. Take photographs of equipment to illustrate problem areas. 	<ol style="list-style-type: none"> 1) This recorder is used as an indicator.
SY.12.1.2	<i>HEPA Filter Diff. Pressure Instr.</i>	<ol style="list-style-type: none"> 1. Inspect instrument tubing where accessible. 2. Inspect equipment and cabinets/terminal boxes for corrosion. 3. Estimate age of equipment. 4. Estimate maintenance repair frequency for equipment. 5. Determine method of calibration and determine if equipment can be calibrated. 6. Take photographs of equipment to illustrate problem areas. 	<ol style="list-style-type: none"> 3) Estimated age of equipment is 15 years 4) Low repair rate 5) Calibration performed annually in the field at 30 minutes per instrument. Instruments are not easily accessible.
SY.12.1.3	<i>Temperature Instrumentation</i>		<ol style="list-style-type: none"> 1) N/A

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT QUESTIONNAIRE INSTRUMENTS & CONTROL SYSTEMS			
REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS	FINDINGS
		DESCRIPTION	
SY.12.1.4	Heater Control Subsystem	<ol style="list-style-type: none"> 1. Inspect instrument cables where accessible. 2. Inspect wiring where accessible. 3. Inspect instrument tubing where accessible. 4. Inspect equipment and cabinets/terminal boxes for corrosion. 5. Estimate age of equipment. 6. Estimate maintenance repair frequency for equipment. 7. Determine method of calibration and determine if equipment can be calibrated. 8. Determine known continuous problems (operating or maintenance) with the equipment. 9. Take photographs of equipment to illustrate problem areas. 	1) Heaters have been removed from service
SY.12.1.5	Fan-Motor Control Subsystem	<ol style="list-style-type: none"> 1. Inspect instrument cables where accessible. 2. Inspect wiring where accessible. 3. Inspect instrument tubing where accessible. 4. Inspect equipment and cabinets/terminal boxes for corrosion. 5. Estimate age of equipment. 6. Estimate maintenance repair frequency for equipment. 7. Determine method of calibration and determine if equipment can be calibrated. 8. Determine known continuous problems (operating or maintenance) with the equipment. 9. Take photographs of equipment to illustrate problem areas. 	1) Fan speed change is accomplished by shutting down fan and adjusting fanbelt sheave.
SY.12.1.6	Damper Control Subsystem	<ol style="list-style-type: none"> 1. Inspect instrument cables where accessible. 2. Inspect wiring where accessible. 3. Inspect instrument tubing where accessible. 4. Inspect equipment and cabinets/terminal boxes for corrosion. 5. Estimate age of equipment. 6. Estimate maintenance repair frequency for equipment. 7. Determine method of calibration and determine if equipment can be calibrated. 8. Determine known continuous problems (operating or maintenance) with the equipment. 9. Take photographs of equipment to illustrate problem areas. 	1) Damper actuators and linkages are in disrepair. Dampers are adjusted manually and locked in place.
SY.12.1.8	Regulated Stack Monitoring System [296-A-27]		
SY.12.1.8.1	<i>Tubing from Stack to CAM</i>	<ol style="list-style-type: none"> 1. Inspect instrument tubing where accessible. 2. Inspect equipment and cabinets/terminal boxes for corrosion. 3. Estimate age of equipment. 4. Determine known continuous problems (operating or maintenance) with the equipment. 5. Take photographs of equipment to illustrate problem areas. 	3) Estimated age of tubing 2 years

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT QUESTIONNAIRE INSTRUMENTS & CONTROL SYSTEMS			
REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS	FINDINGS
		DESCRIPTION	
SY.12.1.8.2	<i>CAM Radiation Analyzer</i>	<ol style="list-style-type: none"> 1. Inspect instrument cables where accessible. 2. Inspect wiring where accessible. 3. Inspect instrument tubing where accessible. 4. Inspect equipment and cabinets/terminal boxes for corrosion. 5. Estimate age of equipment. 6. Estimate maintenance repair frequency for equipment. 7. Determine method of calibration and determine if equipment can be calibrated. 8. Determine known continuous problems (operating or maintenance) with the equipment. 9. Take photographs of equipment to illustrate problem areas. 	<ol style="list-style-type: none"> 7) CAM is calibrated yearly in shop at 8 hours per instrument. 7) CAM weighs in excess of 150 pounds and are hard to access for removal from the cabinets for maintenance of calibration. 6) Low repair rate.
SY.12.1.8.3	<i>CAM Cabinets</i>	<ol style="list-style-type: none"> 1. Inspect equipment and cabinets/terminal boxes for corrosion. 2. Estimate age of equipment. 3. Estimate maintenance repair frequency for equipment. 4. Take photographs of equipment to illustrate problem areas. 	
SY.12.1.8.4	<i>Vacuum Pumps</i>	<ol style="list-style-type: none"> 1. Inspect wiring where accessible. 2. Inspect instrument tubing where accessible. 3. Inspect equipment and cabinets/terminal boxes for corrosion. 4. Estimate age of equipment. 5. Estimate maintenance repair frequency for equipment. 6. Determine known continuous problems (operating or maintenance) with the equipment. 7. Take photographs of equipment to illustrate problem areas. 	<ol style="list-style-type: none"> 4) Estimated age of equipment is 15 years 5) No maintenance history was available (maintenance is performed by the millwrights). 6) No known recurrent problems.
SY.12.1.8.5	<i>Pen Recorder (242-S)</i>	<ol style="list-style-type: none"> 1. Inspect instrument cables where accessible. 2. Inspect wiring where accessible. 3. Inspect equipment and cabinets/terminal boxes for corrosion. 4. Estimate age of equipment. 5. Estimate maintenance repair frequency for equipment. 6. Determine method of calibration and determine if equipment can be calibrated. 7. Determine known continuous problems (operating or maintenance) with the equipment. 8. Take photographs of equipment to illustrate problem areas. 	<ol style="list-style-type: none"> 4) Recently upgraded to industry standard. 7) Remote output to digital data system not being utilized.
SY.12.2	TANK ANNULUS VENTILATION SYSTEM		

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT QUESTIONNAIRE INSTRUMENTS & CONTROL SYSTEMS			
REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS	
		DESCRIPTION	
SY.12.2.1	Annulus Pressure System	<ol style="list-style-type: none"> 1. Inspect instrument tubing where accessible. 2. Inspect equipment and cabinets/terminal boxes for corrosion. 3. Estimate age of equipment. 4. Estimate maintenance repair frequency for equipment. 5. Determine method of calibration and determine if equipment can be calibrated. 6. Determine known continuous problems (operating or maintenance) with the equipment. 7. Take photographs of equipment to illustrate problem areas. 	1) Controlled by manually moving dampers and locking in place.
SY.13	TRANSFER LINE CONTROL SYSTEM		
SY.13.1	PUMP CONTROL SUBSYSTEM	<ol style="list-style-type: none"> 1. Inspect instrument cables where accessible. 2. Inspect wiring where accessible. 3. Inspect equipment and cabinets/terminal boxes for corrosion. 4. Estimate age of equipment. 5. Estimate maintenance repair frequency for equipment. 6. Determine known continuous problems (operating or maintenance) with the equipment. 7. Take photographs of equipment to illustrate problem areas. 	1) Recently upgraded to new pressure monitoring
SY.13.2	VALVE POSITION INSTRUMENTATION/ INDICATION (No automation)		1) N/A
SY.13.3	VALVE CONTROL SYSTEM (DOV in flush Pt)	<ol style="list-style-type: none"> 1. Inspect instrument tubing where accessible. 2. Inspect equipment and cabinets/terminal boxes for corrosion. 3. Estimate age of equipment. 4. Estimate maintenance repair frequency for equipment. 5. Determine known continuous problems (operating or maintenance) with the equipment. 6. Take photographs of equipment to illustrate problem areas. 	1) Pneumatic DOV not accessible.
SY.13.4	PRESSURE SWITCH INSTRUMENTATION (Flow Indication) (Flush Pt)		1) N/A

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT QUESTIONNAIRE INSTRUMENTS & CONTROL SYSTEMS			
REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS	
		DESCRIPTION	
SY.13.5	WASTE FLOW MONITORING INSTRUMENTATION (Service Pit & Flush Pit)	1. Inspect instrument cables where accessible. 2. Inspect wiring where accessible. 3. Inspect equipment and cabinets/terminal boxes for corrosion. 4. Estimate age of equipment. 5. Estimate maintenance repair frequency for equipment. 6. Determine method of calibration and determine if equipment can be calibrated. 7. Determine known continuous problems (operating or maintenance) with the equipment. 8. Take photographs of equipment to illustrate problem areas.	1) N/A
SY.14	TANK CONTENTS MONITORING SYSTEM		
SY.14.1	TEMPERATURE/VAPOR INSTRUMENTATION		1) Age of equipment varies from tank to tank and within each tank from 2 years to 15 years.
SY.14.1.1	Thermocouple Probes	1. Inspect wiring where accessible. 2. Inspect equipment and cabinets/terminal boxes for corrosion. 3. Estimate age of equipment. 4. Estimate maintenance repair frequency for equipment. 5. Determine method of calibration and determine if equipment can be calibrated. 6. Determine known continuous problems (operating or maintenance) with the equipment. 7. Take photographs of equipment to illustrate problem areas.	3) Age of equipment estimated at 15 years 6) Some temperature elements have failed 5) Instrumentation is calibrated yearly and reads remotely to TMACS
SY.14.1.2	Multifunction Instrument Trees	1. Inspect wiring where accessible. 2. Inspect equipment and cabinets/terminal boxes for corrosion. 3. Estimate age of equipment. 4. Determine method of calibration and determine if equipment can be calibrated. 5. Take photographs of equipment to illustrate problem areas.	3) Age of equipment estimated at 2 years Installed in SY-101
SY.14.1.3	Temperature Vapor Probes (velocity-Density Tree?)		1) N/A

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT QUESTIONNAIRE INSTRUMENTS & CONTROL SYSTEMS			
REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS	
		DESCRIPTION	
SY.14.2	STANDARD HYDROGEN MONITORING SYSTEM	1. Inspect instrument cables where accessible. 2. Inspect wiring where accessible. 3. Inspect instrument tubing where accessible. 4. Inspect equipment and cabinets/terminal boxes for corrosion. 5. Estimate age of equipment. 6. Estimate maintenance repair frequency for equipment. 7. Determine method of calibration and determine if equipment can be calibrated. 8. Determine known continuous problems (operating or maintenance) with the equipment. 9. Take photographs of equipment to illustrate problem areas.	5) Age of equipment estimated at 2 years Instrumentation installed on SY-101 and SY-102
SY.14.2.1	Gas Flow Instrumentation		1) Age of equipment estimated at 2 years 2) Calibration performed @ 3 month intervals
SY.14.2.2	H2 Concentration Low Range Instrumentation		1) Age of equipment estimated at 2 years 2) Calibration performed @ 3 month intervals
SY.14.2.3	H2 Concentration High range Instrumentation		1) Age of equipment estimated at 2 years 2) Calibration performed @ 3 month intervals
SY.14.2.4	Gas Temperature Instrumentation		1) Age of equipment estimated at 2 years 2) Calibration performed @ 3 month intervals
SY.14.3	CHEMICAL COMPOSITION INSTRUMENTATION		1) Age of equipment estimated at 2 years 2) Calibration performed @ 3 month intervals
SY.14.3.1	SPECIFIC GRAVITY INSTRUMENTATION		

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT QUESTIONNAIRE INSTRUMENTS & CONTROL SYSTEMS			
REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS	FINDINGS
		DESCRIPTION	
SY 14.3.1.1	SY-101 Specific Gravity Instrumentation	<ol style="list-style-type: none"> 1. Inspect wiring where accessible. 2. Inspect instrument tubing where accessible. 3. Inspect instrument and cabinets/terminal boxes for corrosion. 4. Estimate age of equipment. 5. Estimate maintenance repair frequency for equipment. 6. Determine method of calibration and determine if equipment can be calibrated. 7. Determine known continuous problems (operating or maintenance) with the equipment. 8. Take photographs of equipment to illustrate problem areas. 	<ol style="list-style-type: none"> 4) Age of equipment estimated at 15 years 6) Calibration performed yearly at 1 hour per instrument 7) SPg is indicated as in service
SY 14.3.1.2	SY-102 Specific Gravity Instrumentation		<ol style="list-style-type: none"> 1) Age of equipment estimated at 15 years 2) Calibration performed yearly at 1 hour per instrument
SY 14.3.1.3	SY-103 Specific Gravity Instrumentation		<ol style="list-style-type: none"> 1) Age of equipment estimated at 15 years 2) Calibration performed yearly at 1 hour per instrument
SY 14.4	TANK LIQUID SURFACE LEVEL INSTRUMENTATION	<ol style="list-style-type: none"> 1. Inspect instrument cables where accessible. 2. Inspect wiring where accessible. 3. Inspect equipment and cabinets/terminal boxes for corrosion. 4. Estimate age of equipment. 5. Estimate maintenance repair frequency for equipment. 6. Determine method of calibration and determine if equipment can be calibrated. 7. Determine known continuous problems (operating or maintenance) with the equipment. 8. Take photographs of equipment to illustrate problem areas. 	<p>Direct Tank Liquid Surface Level is read in four ways</p> <ol style="list-style-type: none"> 1) FIC 2) ENRAF Series 854 3) ENRAF Radar 4) Flake box (Manual Tape)
SY 14.4.1	Enraf Riser Extension		<ol style="list-style-type: none"> 1) These instruments are being replaced with ENRAF Series 854. All acceptance criteria should be met by October 1.
SY 14.4.2	Enraf Level Sensor		<ol style="list-style-type: none"> 1) Brand new standard tank level measuring system for West Tank Farms. 2) Most instances old FIC buried cable was used for the signal cable. Buried cable is not available for inspection. 3) Terminal Boxes: the integrity of the weather tight boxes has been compromised by drilling weep holes or by the use of non-weather tight fittings on the conduit

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT QUESTIONNAIRE INSTRUMENTS & CONTROL SYSTEMS			
REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS	
		DESCRIPTION	
SY.14.4.3	Enraf Buried Signal Cable		1) Estimated age 4 years. 2) Improper installation - needs larger diameter riser. Data not used as reliable. 3) Buried cable condition unknown.
SY.14.4.4	Terminal Boxes		1) Estimated age 15 years 2) Equipment cannot be operated or data obtained remotely
SY.14.4.5	Remote Computer Interfaced(s)		
SY.14.5	SLUDGE WEIGHT (LEVEL) MONITORING		
SY.14.6	101-SY GAS MONITORING INSTRUMENTATION		(See previous comments on Standard Hydrogen Monitoring System)
SY.14.7	TANK SURFACE VIDEO MONITORING SYSTEM(S)	1. Inspect instrument cables where accessible. 2. Inspect wiring where accessible. 3. Inspect equipment and cabinets/terminal boxes for corrosion. 4. Estimate age of equipment. 5. Estimate maintenance repair frequency for equipment. 6. Determine method of calibration and determine if equipment can be calibrated. 7. Determine known continuous problems (operating or maintenance) with the equipment. 8. Take photographs of equipment to illustrate problem areas.	Tanks 101-SY and 103-SY have video systems 5) Maintenance is performed approximately yearly (unscheduled) approximately 20 man-days.
SY.14.7.1	In-Tank Camera Subsystem (SY-101)	1. Estimate age of equipment. 2. Determine known continuous problems (operating or maintenance) with the equipment.	1) Age of equipment is 1 year. 2) System requires repairs due to damage from tank environment
SY.14.7.2	Video Display Subsystem (DACS Trailer)	1. Inspect instrument cables where accessible. 2. Inspect wiring where accessible. 3. Inspect equipment and cabinets/terminal boxes for corrosion. 4. Estimate age of equipment. 5. Take photographs of equipment to illustrate problem areas.	3) Video trailer needs permanent skirting installed to protect against weather and rodents.
SY.15	TANK CONTENTS MIXING SYSTEMS		1) Age of Pump 2 years 2) Standby pump has been prepared for deployment pending failure of current pump

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT QUESTIONNAIRE INSTRUMENTS & CONTROL SYSTEMS				
REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS		FINDINGS
		DESCRIPTION		
SY.I5.1	AIR LIFT CIRCULATOR CONTROL SYSTEM			1) N/A
SY.I5.1.1	DIFF. PRESSURE SENSORS	1. Inspect instrument tubing where accessible. 2. Inspect equipment and cabinets/terminal boxes for corrosion. 3. Estimate age of equipment. 4. Estimate maintenance repair frequency for equipment. 5. Determine method of calibration and determine if equipment can be calibrated. 6. Determine known continuous problems (operating or maintenance) with the equipment. 7. Take photographs of equipment to illustrate problem areas.		1) Local indication only 5) Calibration performed yearly 30 minutes per gauge. 6) No known recurrent problems.
SY.I5.1.2	LOCAL ALARM INDICATION	1. Inspect wiring where accessible. 2. Estimate age of equipment. 3. Estimate maintenance repair frequency for equipment. 4. Determine method of calibration and determine if equipment can be calibrated. 5. Determine known continuous problems (operating or maintenance) with the equipment. 6. Take photographs of equipment to illustrate problem areas.		1) Alarm triggers evacuation horn and local annunciator 2) Estimated age 15 years 4) Calibration performed yearly 30 minutes per instrument 5) No known recurrent problems.
SY.I5.2	MIXING PUMP SYSTEM			
SY.I5.2.1	Pump Sensors (Temperatures, Strains, Pressures, Positions)	1. Inspect instrument cables where accessible. 2. Inspect wiring where accessible. 3. Inspect equipment and cabinets/terminal boxes for corrosion. 4. Estimate age of equipment. 5. Estimate maintenance repair frequency for equipment. 6. Determine method of calibration and determine if equipment can be calibrated. 7. Determine known continuous problems (operating or maintenance) with the equipment. 8. Take photographs of equipment to illustrate problem areas.		4) Age of system 2 - 3 years. Labeling is not consistent within loops of the subsystems making maintenance difficult.
SY.I5.2.2	Pump Rotation Variable Speed Drive controller (SY-271)			1) Age of system 2-3 years
SY.I5.2.3	Pump Variable Speed Controller (SY-271)			1) Age of system 2-3 years
SY.I5.2.4	Modicon Interface (Mix. Pump Instr. Cab.)			1) Age of system 2-3 years

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT QUESTIONNAIRE INSTRUMENTS & CONTROL SYSTEMS			
REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS	
		DESCRIPTION	
SY .15.2.5	Mixer Pump (SY-101)		1) Age of pump 2-3 years 2) Spare pump available for installation.
SY .16	SCC STATUS/MONITORING SYSTEM	1. Inspect instrument cables where accessible. 2. Inspect wiring where accessible. 3. Inspect instrument tubing where accessible. 4. Inspect equipment and cabinets/terminal boxes for corrosion. 5. Estimate age of equipment. 6. Estimate maintenance repair frequency for equipment. 7. Determine method of calibration and determine if equipment can be calibrated. 8. Determine known continuous problems (operating or maintenance) with the equipment. 9. Take photographs of equipment to illustrate problem areas.	1) N/A
SY .16.1	AC POWER SUPPLY STATUS INST.		
SY .16.2	AIR SUPPLY STATUS INST.		
SY .16.3	WATER SUPPLY STATUS INST.		
SY .16.4	TANK CONCRETE STRUCTURE TEMPERATURE INST.		
SY .16.5	HEAT TRACE SYSTEM STATUS INST.		
SY .16.6	CATHODIC PROTECTION SYSTEM STATUS INST.		
SY .17	HEAT TRACE CONTROL SYSTEM	1. Inspect instrument cables where accessible. 2. Inspect wiring where accessible. 3. Inspect equipment and cabinets/terminal boxes for corrosion. 4. Estimate age of equipment. 5. Estimate maintenance repair frequency for equipment. 6. Determine method of calibration and determine if equipment can be calibrated. 7. Determine known continuous problems (operating or maintenance) with the equipment. 8. Take photographs of equipment to illustrate problem areas.	

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT QUESTIONNAIRE INSTRUMENTS & CONTROL SYSTEMS			
REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS	
		DESCRIPTION	
SY 17.1	TEMPERATURE MONITORING SENSORS		4) Estimated age of equipment 15 years 6) Instruments function checked yearly at 1 hour per instrument
SY 17.2	TEMP. CONTROLLER SUBSYSTEM		(See 7.1)
SY 17.3	OVER TEMP. CONTROLLER SUBSYSTEM		(See 7.1)
SY 17.4	HEATER CONTACTOR		1) N/A
SY 18	CATHODIC PROTECTION CONTROL SYSTEM	1. Inspect wiring where accessible. 2. Inspect equipment and cabinets/terminal boxes for corrosion. 3. Estimate age of equipment. 4. Estimate maintenance repair frequency for equipment. 5. Determine known continuous problems (operating or maintenance) with the equipment. 6. Take photographs of equipment to illustrate problem areas.	
SY 18.1	POWER CONTROLLER		1) Estimated age 3 years
SY 18.2	SIGNAL WIRING/CONDUIT		1) Estimated age 3 years

8.7 CAIS Data Sheets

241SY INSTRUMENT SYSTEMS NARRATIVE

EQUIPMENT DESCRIPTION

Instrumentation for the leak detection and radiation monitoring is located in the tank annulus, leak detection pits, ventilation systems, waste transfer lines, and both primary and annulus stack monitoring. The leak detection pits include a gamma probe for detecting radiological contamination. The ventilation instrumentation includes stack monitors, steam heater controls (not in service at this time), and HEPA filter differential pressure gauges with high and low pressure alarms. Hydrogen monitoring is also provided. Tank level indication is provided by the use of ENRAF instrumentation with tape and reel backup. The tank annulus is monitored for leaks by the means of manual tape and reel (flake boxes).

SYSTEMS CONDITION SUMMARY

241SY.11.1 LEAK DETECTION PIT/SUMP INSTRUMENTATION

Deficiencies noted for the leak control system include problem areas relative to the gamma probe well structure (moisture infiltration through the cover plate and condensate build up). Coaxial cable is subject to failure from excessive moisture. None the instrument cabinet doors throughout the farm seal properly, allowing dirt and moisture to infiltrate the cabinet. Climate control is not very effective in the farm instrument cabinets with frequent failure of the heaters in the cold of winter and during excessive heat in the summer months (doors are often left open in the warmer months for cooling).

The liquid temperature thermocouple trees are 15 years old and many of the sensors have failed.

241SY.1.2 ANNULUS LEAK INSTRUMENTATION

The cabinets with continuous air monitoring (CAMs) installed are not designed with the ease of calibration and maintenance in mind. The CAMs weigh in excess of 100 pounds are difficult to remove for calibration or maintenance. Pen recorders in 271-S are fifteen years old and require frequent repair action to keep them functional. The recorders in 242-S have been upgraded to current industry standards and are in good condition.

The liquid presence sensors (flake boxes) exhibited a presence of condensate at the terminal boxes. O-ring seals require frequent repair/replacement.

241SY.I2.1 TANK PRIMARY VENTILATION SYSTEM

The field instrument tubing is not installed with maintenance in mind. The positioning of the tubing, instruments, and fittings make it difficult to perform repair work. All of the pen recorders in the instrument building require extensive maintenance and repair action in order to bring them within design calibration requirements.

The steam coil heaters have been removed from service.

The ventilation system damper actuators and linkage are in disrepair. Dampers are manually adjusted and locked in place.

The cabinets with continuous air monitoring (CAMs) installed are not designed with the ease of calibration and maintenance in mind. The CAMs weigh in excess of 100 pounds are difficult to remove for calibration or maintenance. The recorders in 242-S have been upgraded to current industry standards and are in good condition.

241SY.4 TANK CONTENTS MONITORING SYSTEM

Some of the thermocouple probes have failed (appears to be a common problem within all of the farms).

ENRAF series 854 liquid level instruments have been recently installed and are in good condition. Most of the terminal boxes in the farm do not seal properly allowing dirt and moisture to infiltrate the boxes.

241SY.I6.2 AIR SUPPLY STATUS INSTRUMENTATION

Instrument air tubing appears to be in good condition at the exterior surface and the instrument air supply system has recently been upgraded. It is reported by maintenance that the old air supply system has contaminated the existing air lines with dirt and moisture.

The overall condition of the instrumentation at SY farm is rated as "fair" 5.

CONDITION ASSESSMENT INFORMATION SYSTEM

Report : RELATED SITE EQUIPMENT

Filename : RPTEQPT.lis

Run by : CAIS

Report Date : 29-NOV-95

Parameters Entered

Parent Equipment ID: %

CAIS Special Report - RPT-005

Asset	Site Component	Name	Sys No.	System Name

241SY-0000	: UNDRGRND WASTE STOR TANK FARM			
241SY ANN VENT	TK ANNULUS VENTILATION			
241SY MK-4504 THRU 4506	DAMPERS			
CONTROLLED BY MANUALLY MOVING DAMPERS AND LOCKING IN PLACE.				
241SY PS-1-2	PRESSURE SWITCH			
PRESSURE SWITCH PS-1-2 SHUTS DOWN THE FAN WHEN PRESSURE GETS BELOW 6 INCHES W.G.				
241SY CAM RAD MON	CAM RADIATION MONITORING			
241SY AIR PROBE	AIR SAMPLER PROBE/TUBING/ELECT			
PROBE COULD NOT BE ACCESSED. THE TUBING HAS NO SIGNS OF CORROSION OR DAMAGE.				
241SY RIAS-101 THRU 103-1	RADIATION ANALYZER			
ESTIMATED AGE OF EQUIPMENT IS 15YRS. CALIBRATED ANNUALLY IN THE SHOP AT 8HRS PER				
				1.2.1.1 Air S
				1.2.1.2 Radia

INST. LOW REPAIR RATE.

241SY 241SY-101 THRU 103-CAB CABINETS

1.2.1.3 Cabinets (at each tank)

DOORS DO NOT FIT PROPERLY ALLOWING DUST INFILTRATION. POOR CLIMATE CONTROL-HOT IN THE SUMMER AND COLD IN THE WINTER.

241SY WIRE

SIGNAL WIRING/TBX/CONDUIT

1.2.1.5 Signal Wiring/ Conduit

SIGNAL WIRING IS IN GOOD CONDITION BUT IS NOT WELL MARKED OR DOCUMENTED FOR TRACING.

241SY-271 RR-EXH-101 THRU 103 1-PEN RECORDER & ALARMS 1.2.1.4 1-Pen recorder & Alarms(SY-271 & 242-S)

RECORDERS IN 242-S WERE RECENTLY UPGRADED TO CURRENT INDUSTRY STANDARDS. RECORDERS IN 271-S ARE 15YRS OLD. ALARMS ARE RELAYED OFF OF FIELD SENSORS.

241SY CPCS

CATHODIC PROTECTION CTRL SYS

241SY PWR CTRL

POWER CONTROLLER

8.1 POWER CONTROLLER

CONDITION ASSESSMENT INFORMATION SYSTEM

29-NOV-95

CAIS Special Report - RPT-005

Asset	Site Component	Name	Sys No.	System Name
	Survey Component			
	Survey Comment			

241SY-0000 : UNDRGRND WASTE STOR TANK FARM

ESTIMATED AGE OF EQUIPMENT IS 3 YEARS.

241SY SIGNAL WIRE SIGNAL WIRING/CONDUIT 8.2 SIGNAL WIRING/CONDUIT

ESTIMATED AGE IS 3 YEARS.

241SY LPS LIQUID PRESENCE SENSOR

241SY LDE-101-103-1A THRU C LIQUID PRESENCE SENSOR 1.2.2 Liquid Presence Sensor

EST AGE 15YRS. FUNCTIONALLY TESTED MONTHLY.TBX'S EXHIBITED CONDENSATION ON ALL F LAKE BOXES. O-RING SEAL ARE FREQUENTLY R EPLACED.A LARGE VOLUME OF PURGE AIR IS U SED AT EACH FLAKE BOX.RECOMMEND REPLACEM ENT WITH ENRAF SERIES 854 FOR REMOTE ACC ESS.

241SY M PMP MIXING PUMP SYSTEM

241SY MODICON	MODICON INTERFACE	Y.52.4 MODICON INTERFACE MIX.PMP CAB
AGE OF SYSTEM IS 2 TO 3 YEARS.		
241SY PMP SENSOR	PUMP SENSORS (TEMP,S,PRESS,PO)	5.2.1 Pump Sensors (Temperatures, Strains, Pre
AGE OF SYSTEM 2 TO 3 YEARS. LABELING IS NOT CONSISTENT WITHIN LOOPS OF THE SUBSY STEMS MAKING MAINTENANCE DIFFICULT.		
241SY MP	MIXER PUMP (SY-101)	5.2.5 Mixer Pump (SY-101)
AGE OF PUMP 2 TO 3 YEARS. SPARE PUMP AVAILABLE FOR INSTALLATION.		
241SY271 PMP ROTAT	PMP ROTATION VAR SPEED DR CTRL	5.2.2 Pump Rotation Variable Speed Drive contr
AGE OF SYSTEM 2 TO 3 YEARS.		
241SY271 PMP VS CTRL	PMP VARIABLE SPEED CONTROLLER	5.2.3 Pump Variable Speed Controller (SY-271)
AGE OF SYSTEM 2 TO 3 YEARS.		

CAIS Special Report - RPT-005

Asset	Site Component	Name	Sys No.	System Name
Survey Component	Survey Comment			

241SY-0000 : UNDERGRND WASTE STOR TANK FARM

241SY RAD MON GAMMA RADIATION MONITORING SYS

241SY LDP-01C THRU 03C GAMMA PROBE WELL STRUCTURE 1.1.1.1 Gamma Probe Well Structure

COVER PLATE IS NOT SEALED PROPERLY AND WATER ACCUMULATES IN WELL FROM INFILTRATION AND CONDENSATION.

241SY RE-01C THRU 03C-1 GAMMA PROBE & WELL CABLE 1.1.1.2 Gamma Probe & Well Cable

COAXIAL CABLE IS SUBJECT TO FAILURE FROM EXCESSIVE MOISTURE.

241SY CRM-01C THRU 03C-1 LOG ALARM COUNT RATE METER 1.1.1.5 Log Alarm Count Rate Meters/ Alarm

compa

ESTIMATED AGE OF EQUIPMENT IS 15YRS. EQUIPMENT IS REMOVED FROM SERVICE EVERY 6 MONTHS FOR IN SHOP CALIBRATION.

241SY SHMS STANDARD HYDROGEN MONITORING S

241SY SHMS-CAB SHMS CABINETS 4.2 STANDARD HYDROGEN MONITORING SYSTEM

AGE OF EQUIPMENT ESTIMATED AT 2 YEARS IN
STRUMENTATION INSTALLED ON SY-101 & SY10
2.

241SY TK CM TANK CONTENTS MONITORING SYS

241SY TEMP/VAPOR TEMPERATURE/VAPOR INSTRUMENT 4.1 TEMPERATURE/VAPOR
INSTRUMENTATION

AGE OF EQUIPMENT VARIES FROM TANK TO TAN
K AND WITHIN EACH TANK FROM 2 YEARS TO 1
5 YEARS.

241SY TE-101 THRU 103 THERMOCOUPLE PROBES 4.1.1 Thermocouple Probes

ESTIMATED AGE OF EQUIPMENT IS 15 YEARS.
SOME TEMPERATURE ELEMENTS HAVE FAILED. I
NSTRUMENTATION IS CALIBRATED ANNUALLY AN
D READS REMOTELY TO TMACS.

241SY MIT MULTIFUNCTION INSTRUMENT TREES 4.1.2 Multifunction Instrument Trees

AGE OF EQUIPMENT ESTIMATED AT 2 YEARS IN
STALLED IN SY-101.

241SY TK C MIXING TANK CONTENTS MIXING SYSTEMS 5. TANK CONTENTS MIXING SYSTEMS

Asset	Site Component	Name	Sys No.	System Name
241SY-0000	: UNDRGRND WASTE STOR TANK FARM			
	AGE OF PUMP IS 2 YEARS. STANDBY PUMP HAS BEEN PREPARED FOR DEPLOYMENT PENDING FAILURE OF CURRENT PUMP.			
241SY DPS	DIFF PRESSURE SENSOR	5.1.1	DIFF. PRESSURE SENSORS	
	NO KNOWN RECURRENT PROBLEMS. LOCAL INDICATION ONLY. CALIBRATED YEARLY AT 30 MINUTES PER GAUGE.			
241SY LOCAL ALARM	LOCAL ALARM INDICATION	5.1.2	LOCAL ALARM INDICATION	
	ALARM TRIGGERS EVACUATION HORN AND LOCAL ANNUNCIATOR. EST AGE OF EQUIP IS 15 YEARS. CALIBRATED YEARLY AT 30 MINUTES PER INST. NO KNOWN RECURRENT PROBLEMS.			
241SY TK SVM	TK SURFACE VIDEO MONITORING			
241SY TK VIDEO SYSTEM(S)	TK SURFACE VIDEO MONITORING	4.7	TANK SURFACE VIDEO MONITORING	
	TANKS 101-SY & 103-SY HAVE VIDEO SYSTEMS			

8.7-10

241SY SY-101 IN-TK CAMERA	IN-TK CAMERA SUBSYSTEM	4.7.1	In-Tank Camera Subsystem (SY-101)
AGE OF EQUIPMENT IS 1 YEAR. SYSTEM REQUI RES REPAIRS DUE TO DAMAGE FROM TANK ENVI RONMENT.			
241SY V DISPLAY	VIDEO DISPLAY (DACS TRAILER)	4.7.2	Video Display Subsystem (DACS Trailer)
VIDEO TRAILER NEEDS PERMANENT SKIRTING I NSTALLED TO PROTECT AGAINST WEATHER AND RODENTS			
241SY TK LSL	TANK LIQUID SURFACE LEVEL INST .		
241SY LLI-FB-101 THRU 103 INSTRUMENTATIO	TK LIQUID SURFACE LEVEL	4.4	TANK LIQUID SURFACE LEVEL
TANK LIQUID SURFACE LEVEL IS READ FOUR W AYS. 1)FIC, 2)ENRAF SERIES 854)ENRAF RADAR & 4)FLAKE BOX (MANUAL TAPE)			
241SY ENRAF RE	ENRAF RISER EXTENSION	4.4.1	Enraf Riser Extension

CAIS Special Report - RPT-005

Asset	Site Component	Name	Sys No.	System Name
	Survey Component			
	Survey Comment			

241SY-0000	: UNDRGRND WASTE STOR TANK FARM			
THESE INSTRUMENTS ARE BEING REPLACED WITH ENRAF SERIES 854. ALL ACCEPTANCE CRITERIA SHOULD BE MET BY OCT 1st.				
241SY LLE-FB-101	THRU 103	ENRAF LEVEL SENSOR	4.4.2	Enraf Level Sensor
BRAND NEW STANDARD TANK LEVELSYSTEM FOR WEST TKF. MOST INSTANCES OLD FIC BURIED CABLE WAS USED FOR THE SIGNAL CABLE. BURIED CABLE IS NOT AVAILABLE FOR INSPECTION.				
241SY ENRAF SC	ENRAF BURIED SIGNAL CABLE		4.4.3	Enraf Buried Signal Cable
BURIED SIGNAL CABLE CONDITION UNKNOWN.				
241SY ENRAF TBX'S	TERMINAL BOXES		4.4.4	Terminal Boxes
THE INTEGRITY OF THE WATER TIGHT BOXES HAS BEEN COMPRISED BY DRILLING WEEP HOLES OR BY THE USE OF NON-WATER TIGHT FITTINGS ON THE CONDUIT.				
241SY WF&SpG MON	WF&SpG MONITORING SUBSYSTEM			

241SY WF&SpG SURVEY	WF&SpG MONITORING SUBSYSTEM	1.1.2	Weight Factor & Specific Gravity Monitor
THE INSTRUMENT AIR SUPPLY HAS RECENTLY BEEN UPGRADED (2 YEARS),BUT PREVIOUSLY SUPPLIED WET,DIRTY,AIR.			
241SY SAMPLE TUBES	SAMPLE TUBES (LEAK DET. PITS)	1.1.2.1	Sample Tubes (Leak Det. Pits)
SAMPLE TUBES THAT WERE ACESSEED ARE IN GOOD CONDITION.			
241SY PRESS SENSORS	WF&SpG PRESSURE SENSORS	1.1.2.2	Weight Factor & Specific Gravity Pressur
ESTIMATED AGE OF EQUIPMENT IS 15YRS. APPEARS TO BE IN GOOD CONDITION.			
241SY TK 101-103-WFT-01C-1&2	WF PRESSURE SENSORS	1.1.2.2	Weight Factor & Specific Gravity Pressur
ESTIMATED AGE OF EQUIPMENT IS 15YRS. APPEARS TO BE IN GOOD CONDITION.			
241SY TK-101-103-SGT-01C-1	SpG PRESSURE SENSOR	1.1.2.2	Weight Factor & Specific Gravity Pressur
EST. AGE OF EQUIP IS 15YRS. APPEARS TO BE IN GOOD CONDITION.			

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CONDITION ASSESSMENT INFORMATION SYSTEM

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CAIS Special Report - RPT-005

Asset

Site Component	Name	Sys No.	System Name
Survey Component			
Survey Comment			

241SY-0000 : UNDRGRND WASTE STOR TANK FARM

241SY 241-SY-01C-1 THRU 3 WF CABINETS XMITTER ENCLOSURE 1.1.2.3 Weight Factor Cabinet (Xmitter Enclosure

CABINET DOORS DO NOT SEAL PROPERLY ALLOWING DIRT TO INFILTRATE THE CABINET. CLIMATE CONTROL IS NOT EFFECTIVE-RESISTANCE HEATER SOMETIMES DOES NOT WORK IN THE WINTER, WITH NO COOLING CAPACITY IN THE SUMMER.

241SY F TUBE

FIELD TUBING

1.1.2.4 Field Tubing

TUBING IS ROUTED IN BURIED CONDUIT FROM REMOTE CABINETS TO 271S. TUBING APPEARS TO BE IN GOOD CONDITION BUT HAS BEEN FILLED WITH WATER AND DEBRIS FROM PREVIOUS AIR INSTRUMENT SYSTEM.

241SY WFAS-01C THRU 03C-1

WF&SpG PRESS SW & INDICATORS

1.1.2.5 W.F. & SpG Pressure Switches &

Indicator

CALIBRATION IS ANNUALLY PERFORMED IN THE FIELD AT 1HR PER INST. NO RECURRENT PROBLEM WITH LOW REPAIR RATE. ESTIMATED AGE

OF EQUIPMENT IS 15YRS.

241SY TL-CTRL	TRANSFER LINE CONTROL SYSTEM		
241SY PMP CONTROL	PUMP CONTROL SUBSYSTEM	3.1	PUMP CONTROL SUBSYSTEM
RECENTLY UPGRADED TO NEW PRESSURE MONITORING RING.			
241SY SpG INST	SPECIFIC GRAVITY INSTRUMENT'S		
241SY SpG-101 THRU 103	SpG INSTRUMENTATION	4.3.1.3	SY-103 Specific Gravity Instrumentation
ESTIMATED AGE OF EQUIPMENT IS 15 YEARS. CALIBRATED ANNUALLY AT 1 HR PER INST. 10 1SY SpG IS INDICATED AS IN SERVICE.			
241SY RSM-EXH-K1-1	REGULATED STACK MONITOR		
241SY CAM TUBING	TUBING CAM TO STACK	2.1.8.1	Tubing from Stack to CAM
ESTIMATED AGE OF THE TUBING IS 2 YEARS.			

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CONDITION ASSESSMENT INFORMATION SYSTEM

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CAIS Special Report - RPT-005

Asset

Site Component	Name	Sys No.	System Name
Survey Component			
Survey Comment			

241SY-0000 : UNDRGRND WASTE STOR TANK FARM

241SY EXH-K1-CAM-1 CAM RADIATION ANALYZER 2.1.8.2 CAM Radiation Analyzer

CAM'S ARE CALIBRATED ANNUALLY IN THE SHOP AT 8HRS PER INSTRUMENT. CAM'S WEIGH IN EXCESS OF 100 POUNDS AND ARE HARD TO ACCESS FOR REMOVAL FROM THE CABINETS FOR MAINTENANCE OF CALIBRATION. LOW REPAIR RATE.

241SY EXH-K1-1-CAB CAM CABINETS 2.1.8.3 CAM Cabinets
241SY K1-EXH-VP-1&2 VACUUM PUMPS 2.1.8.4 Vacuum Pumps

ESTIMATED AGE OF EQUIPMENT IS 15 YEARS. EQUIPMENT IS FUNCTIONALLY TESTED. NO MAINTENANCE HISTORY AVAILABLE. MAINT IS PERFORMED BY THE MILLWRIGHTS. NO KNOWN CURRENT PROBLEMS.

241SY RR-EXH-K1-1-1 PEN RECORDER 242S 2.1.8.5 ?-Pen Recorder (242-S)

RECENTLY UPGRADED TO INDUSTRY STANDARDS. REMOTE OUTPUT TO DIGITAL SYSTEM NOT BEING UTILIZED.

241SY PIPELINE LEAK	PIPELINE LEAK INSTRUMENT	
241SY LDE-COB-SY-1 THRU 6	COB LIQUID PRESENCE SENSOR	1.3.1 C.O.B. Liquid Presence Sensor
FUNCTIONAL TESTED MONTHLY OR BIMONTHLY. EST AGE OF EQUIPMENT IS 15 YEARS.		
241SY PRESS SW SENSOR	PIPELINE PRESSURE SWITCH SENSO	1.3.2 Pipeline Pressure Switch Sensor
PRESSURE SWITCHES ARE LOCATED IN THE PIT AND ARE NOT ACCESSIBLE FOR MAINTENANCE.		
241SY LDE-01&02-A THRU D-1	TRANSFER PITS LIQUID PRESENCE	1.3.3 Transfer Pits; Liquid Presence Sensor
REQUIRES FREQUENT MAINTENANCE. NO CALIBRATION POSSIBLE.		
241SY PPSW	PIT PRESSURE SWITCHES	1.3.3.2 Pit Pressure Switch(s)
CALIBRATION NOT POSSIBLE DUE TO ACCESS LIMITATIONS.		
241SY PIPELINE WIRE	SIGNAL WIRING/TBX/CONDUIT	1.3.3.3 Signal Wiring/Conduit/Terminal Boxes

CAIS Special Report - RPT-005

Asset	Site Component	Name	Sys No.	System Name
Survey Component				
Survey Comment				

241SY-0000 : UNDRGRND WASTE STOR TANK FARM

WIRING AT TERMINAL BOXES IN THE SY FARM
NEED TO BE REPLACED. WIRE INSULATION IS
BRITTLE AND CRACKED. CURRENT SENSITIVE R
ELAYS ARE FUNCTIONALLY TESTED BY ELECTRI
CIANS AND RELAYS ARE REPLACED AS THEY FA
IL.

241SY LTS LIQUID TEMPERATURE SENSOR

241SY TE-01C THRU 03C-1 LIQUID TEMPERATURE SENSOR 1.1.4 Liquid Temperature Sensor

EQUIPMENT HAS BEEN CONNECTED TO TMACS. T
HERMOCOUPLES TREES ARE 15YRS OLD AND MAN
Y OF THE SENSORS HAVE FAILED.

241SY HT CTRL HEAT TRACE CONTROL SYSTEM

241SY TEMP SEN TEMPERATURE MONITORING SENSORS 7.1 TEMPERATURE MONITORING SENSORS

ESTIMATED AGE OF EQUIPMENT IS 15 YEARS.

INSTRUMENT FUNCTION CHECKED YEARLY AT 1
HOUR PER INSTRUMENT.

241SY271-0000 : INSTRUMENT CONTROL HOUSE

241SY K1-TK-VENT TK PRIMARY VENTILATION

241SY TK RISER TUBE TK RISER TUBING TO PRESS S XMI 2.1.1.1 Tank Riser Tubing to Pressure Sensor/Tra
TUBING IS IN GOOD CONDITION.

241SY PI-101 THRU 103-1&2 PRESSURE SENSOR XMITTER 2.1.1.2 Pressure Sensor-Transmitters
NO REMOTE READOUT CAPABILITY.

241SY AIR TUBE FIELD INSTRUMENT AIR TUBING 2.1.1.3 Field Instrument Air Tubing

INSTRUMENT TUBING WAS NOT INSTALLED WITH
INSTRUMENT MAINTENANCE IN MIND.

241SY PAS-101-103-1,2&1-1 PRESSURE SWITCH/ALARM 2.1.1.4 Pressure Switch/Alarm

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CONDITION ASSESSMENT INFORMATION SYSTEM

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CAIS Special Report - RPT-005

Asset	Site Component	Name	Sys No.	System Name
Survey Component				

241SY271-0000 : INSTRUMENT CONTROL HOUSE

CALIBRATED ANNUALLY IN THE FIELD AT 1HR
PER INST REQUIRES SYSTEM SWITCHOVER TO V
ERIFY INTERLOCKS. LOW REPAIR RATE. EST A
GE OF EQUIP IS 15YRS.

241SY K1-DPI-2-1 THRU 3 HEPA FILT DIFF PRESSURE INSTRU 2.1.2 HEPA Filter Diff. Pressure Instr.

EST EQUIPMENT AGE IS 15YRS. LOW REPAIR R
ATE. ANNUAL FIELD CALIBRATION @ 30 MINUT
ES/INSTRUMENT. UNITS ARE NOT EASILY ACCE
SSIBLE.

241SY K1-T1-1-1 & 2 HEATER CONTROL SUBSYSTEM 2.1.4 Heater Control Subsystem

HEATERS HAVE BEEN REMOVED FROM SERVICE.

241SY MK-4501 TO 4503 DAMPER CONTROL SUBSYSTEM 2.1.6 Damper Control Subsystem

DAMPERS ARE ADJUSTED MANUALLY & ARE LOCK
ED IN PLACE.

241SY-271 PR-101 THRU 103-1&2 2 PEN PRESSURE RECORDERS 2.1.1.5 2-Pen Pressure Recorders (241-SY-271)

THIS RECORDER IS USED AS AN INDICATOR.

MCC-241SY-271-C3A FAN MOTOR CONTROL SUBSYSTEM 2.1.5 Fan-Motor Control Subsystem

FAN SPEED CHANGE IS ACCOMPLISHED BY SHUTTING FAN DOWN AND ADJUSTING FANBELT SHEAVE.

241SY-271 ANN A & A PNL LOCAL A ANNUNCIATION & A PNL

241SY-271 ANN-101 THRU 103 LOCAL ANNUNCIATION & A PNL 1.5.1 Alarm Panel in 241-SY-271

WIRING IN 271 IS IN GOOD CONDITION.

241SY-271 L TKF A PNL LOCAL TKF ALARM PANEL 1.5.2 Local Tank Farm Alarm Panel

ESTIMATED AGE OF EQUIPMENT IS 15YRS.

241SY-271 242S-A-PNL 242S ALARM PANEL 1.5.3 242-S Alarm Panels

ESTIMATED AGE OF EQUIPMENT VARIES FROM NEW TO 15YRS.

241SY-271 GAMEWELL REMOTE ALARM SIGNALING GW-LOOP

29-NOV-95

CONDITION ASSESSMENT INFORMATION SYSTEM

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CAIS Special Report - RPT-005

Asset

Site Component	Name	Sys No.	System Name
Survey Component			
Survey Comment			

241SY271-0000 : INSTRUMENT CONTROL HOUSE

241SY-271 GAMEWELL REMOTE ALARM SIGNALING GW-LOOP

241SY-271 R,A,S GW-LOOP REMOTE ALARM SIGNALING GW-LOOP 1.6 REMOTE ALARM SIGNALING (GAMEWELL LOOP)

THIS SYSTEM IS BEING UPGRADED TO A NEW SYSTEM WITH INDUSTRY STANDARD REMOTE REPORTING FEATURES.

241SY-271 PP INST MPS PUMP PREMISSIVE INSTRUMENT

241SY PP INST WIRE SIGNAL WIRING/TBX/CONDUIT 1.4.3 Signal Wiring/Conduit/Terminal Boxes

EST AGE IS 15YRS. INTEGRITY OF THE WATER TIGHT BOXES HAS BEEN COMPRISED BY DRILLING WEEP HOLES AND BY THE USE OF NON-WEATHER TIGHT FITTINGS ON THE CONDUIT.

241SY 241-SY-271-CAB MPS RELAY PANEL 1.4.1 241-SY-271 Master Pump Shutdown Relay Panel

WIRING IN RELAY PANEL; IS IN GOOD CONDITION. EST AGE OF EQUIP IS 15YRS. MAINTENANCE

NCE HISTORY IS UNKNOWN. PRINTS NEED TO BE
E UPDATED FOR BETTER RELIABILITY OF MAI
NTENANCE.

241SY-271 MPS CTRL PNL MPS PUSHBUTTON CTRL PNL 1.4.2 MPS Pushbutton Control Panel (242-S)

WIRING IN THE CONTROL PANEL IS IN GOOD C
ONDITION. EST AGE OF EQUIP IS 15YRS. MAI
NTENANCE HISTORY UNKNOWN. PRINTS NEED TO
BE UPDATED FOR BETTER RELIABILITY OF MA
INTENANCE.

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8.8 Other Reports

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8.9 CAMP Work Sheets

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WHC-SD-W314-ES-018, Rev 0
CAMP RATING FORM

Project Title: SY T.F.: Leak Control System: Leak Det. Pit: Gamma Rad. Mon. Subsystem

B&R Code: _____ **Rev #:** 0 **FY:** 1996

Project Id #: SY.11.1.1 **FUDS:** _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.		30		30
Technological Base (R&D)		30		30
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics				
Criticality				
Infrastructure				40
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				30
Mission Capability, Capacity, & Quality				40
Asset Condition				55
National Business Strategies/Partnerships				
Highest of Each Subcategory	20	30	20	55

PROJECT RATING:	56
Final Project Rating	56

Note: 20 is a Default Rating

C.D. Acree	376-1901	9/22/95
Rated By	Ext	Date Rated

Reviewed By	Ext	Date Reviewed
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Applicable Regulations or Policies

ER/WM, Compliance, 30: Minimum detection capability lacking
M&I, Asset Condition, 55: Aging System, Spare Parts availability concern.
M&I, Infrastructure, 40: Substandard Operation
M&I, Mission Capability, 40: System not designed to operate in a wet environment.

Additional Information & Affected Projects

Shaded Areas Are Not For Use

WHC-SD-W314-ES-018, Rev 0

CAMP RATING FORM

Project Title: SY Tank Farm/Leak Control System/Leak Detection System Pit WF&SpG Monitor

B&R Code: _____ **Rev #:** 0 **FY:** 1996

Project Id #: SY.II.1.2 **FUDS:** _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.				
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics				
Criticality				
Infrastructure				40
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				50
Asset Condition				50
National Business Strategies/Partnerships				
Highest of Each Subcategory	20	20	20	50

PROJECT RATING: 50

Final Project Rating 50

Note: 20 is a Default Rating

C. D. Acree		9/22/95
Rated By	Ext	Date Rated

Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

M&I, Asset Cond., 50: Foxboro equipment is obsolete , spare parts may not be available.

M&I, Capability, 50: Does not measure liquid level directly, uses pressure.

M&I, Infrastructure, 40: System is a continuous user of instrument air.

Additional Information & Affected Projects

Shaded Areas Are Not For Use

WHC-SD-W314-ES-018, Rev 0

CAMP RATING FORM

Project Title: SY Tank Farm Annulus Leak Instrumentation/ CAM Rad. monitoring System

B&R Code: _____ Rev #: 0 FY: 1996

Project Id #: SY.11.2.1 FUDS: _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.				
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety	35			
Fire Protection				
Health Physics	40			
Criticality				
Infrastructure				40
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				40
Asset Condition				35
National Business Strategies/Partnerships				
Highest of Each Subcategory	40	20	20	40

PROJECT RATING:	43
Final Project Rating	43

Note: 20 is a Default Rating

C. D. Acree		9/22/95
Rated By	Ext	Date Rated

Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

H&S, Health Physics, 40: Potential for personnel radiation exposure.
H&S, Industrial Safety, 35: Potential for personnel injury lifting CAM unit (100lbs)

Additional Information & Affected Projects

M&I, Asset Condition, 40: Aging System, subject to false alarms
M&I, Mission Capability, 35: Aging system, not latest recommend site standard, false alarms, radon interf
M&I, Infrastructure, 40: Aging System, subject to false alarms & is difficult to lift.

WHC-SD-W314-ES-018, Rev 0

CAMP RATING FORM

Project Title: SY Tank Farm Annulus Leak Inst./Manual Tape Cond. Probe (FlakeBox)

B&R Code: _____ Rev #: 0 FY: 1996

Project Id #: SY.II.2.2 FUDS: _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.		40		
Technological Base (R&D)				30
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics				
Criticality				
Infrastructure				40
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				55
Asset Condition				50
National Business Strategies/Partnerships				
Highest of Each Subcategory	20	40	20	55

PROJECT RATING:	57
Final Project Rating	57

Note: 20 is a Default Rating

C. D. Acree		9/22/95
Rated By	Ext	Date Rated

Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

M&I, Asset Condition, 50: Deteriorated, UV damaged, elec. insulation.
M&I, Mission Capability, 55: Only 1 per annulus, inadequate coverage, & a poor instrument at that.
ER/WM, Compliance, 40; Fails to detect some leaks, subject to operator interpretation
Note: only one sensor per tank.

Additional Information & Affected Projects

M&I, Infrastructure, 40: Aging System, deteriorating, large consumer of instrument air.
M&I, Tech Base, 30: Not a standard industrial design, expensive to fabricate.

Shaded Areas Are Not For Use

WHC-SD-W314-ES-018, Rev 0

CAMP RATING FORM

Project Title: SY Tank Farm/Pipeline Leak Inst./PitLiquid Leak Detect. Sub. Sys./COB, Transfer

B&R Code: _____ Rev #: 0 FY: 1996

Project Id #: SY.I1.3.1, SY.I1.3.3, SY.I1.1.3, SY.I1.2.3 FUDS: _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.		50		
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety	35			
Fire Protection				
Health Physics	50			
Criticality				
Infrastructure				50
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				50
Asset Condition				55
National Business Strategies/Partnerships				
Highest of Each Subcategory	50	50	20	55

PROJECT RATING: 60

Final Project Rating 60

Note: 20 is a Default Rating

C. D. Acree		9/22/95
Rated By	Ext	Date Rated

Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

H&S, Health Physics, 50: Potential for maintenance personnel radiation exposure.
H&S, Industrial Safety, 35: Potential for personnel injury working in pits.
ER/WM, Compliance, 50: Cannot detect small leaks or detect secondary containment failure.

Additional Information & Affected Projects

M&I, Asset Condition, 55: Aging System, subject to false alarms
M&I, Mission Capability, 50: System can not detect small leaks, can not detect secondary containment failure, cannot calibrate system, cannot verify system operability.
M&I, Infrastructure, 50: Not compliant with NEC, wiring insulation unsafe, wiring life expectancy is short.

Shaded Areas Are Not For Use

WHC-SD-W314-ES-018, Rev 0

CAMP RATING FORM

Project Title: SY Tank Farm/Pipeline Leak Inst./Pipeline Annulus Pressure Sensor

B&R Code: _____ **Rev #:** 0 **FY:** 1996

Project Id #: SY.I1.3.2 **FUDS:** _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.		50		
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety	35			
Fire Protection				
Health Physics	50			
Criticality				
Infrastructure				40
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				50
Asset Condition				40
National Business Strategies/Partnerships				
Highest of Each Subcategory	50	50	20	50

PROJECT RATING:	56
Final Project Rating	56

Note: 20 is a Default Rating

<u>C. D. Acree</u>		<u>9/29/95</u>
Rated By	Ext	Date Rated
Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

ER/WM, Compliance, 50: Pipelines do not have Inst. that can detect pl secondary containment failure.
M&I, Mission Capability, 50: System sensitivity is unknown, it cannot be calibrated, is difficult to verify operability, not available on all pipelines.

Additional Information & Affected Projects

H&S, Health Physics, 50: Potential for maintenance personnel radiation exposure.
M&I, Asset Condition, 40: Aging system, suspected corroded valves may inhibit system functionality.
M&I, Infrastructure, 40: System is continual user of instrument air.

(See SY.I1.3.1)

Shaded Areas Are Not For Use

WHC-SD-W314-ES-018, Rev 0 **CAMP RATING FORM**

Project Title: SY Tank Farm Pump Permissive (Master Pump Shutdown)

B&R Code: _____ **Rev #:** 0 **FY:** 1996

Project Id #: SY.11.4 **FUDS:** _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.				
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics				
Criticality				
Infrastructure				45
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				55
Asset Condition				55
National Business Strategies/Partnerships				
Highest of Each Subcategory	20	20	20	55

PROJECT RATING:	55
Final Project Rating	55

Note: 20 is a Default Rating

<u>C. D. Acree</u>		<u>9/22/95</u>
Rated By	Ext	Date Rated

Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

M&I, Mission Capability, 55: Mission adversely impacted by false alarms, any alarm in all tank farms can shut down a transfer, even in farms that are unrelated.

M&I, Asset Condition, 55: Really the same as the Leak Detection system.

M&I, Infrastructure, 45: Spurious shutdowns cause delays and idle lots of people.

Additional Information & Affected Projects

M&I, Mission Capability, 55: System provides no operational versatility. cannot easily make simultaneous transfers. Cannot easily isolate operations in different facilities.

Shaded Areas Are Not For Use

WHC-SD-W314-ES-018, Rev 0

CAMP RATING FORM

Project Title: SY Tank Farm Remote Alarm Signaling System (Gamewell Loop Sys.)

B&R Code: _____ **Rev #:** 0 **FY:** 1996

Project Id #: SY.II.6 **FUDS:** _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.				
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics				
Criticality				
Infrastructure				40
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				35
Asset Condition				50
National Business Strategies/Partnerships				
Highest of Each Subcategory	20	20	20	50

PROJECT RATING: 50

Final Project Rating 50

Note: 20 is a Default Rating

C. D. Acree	9/22/95
Rated By	Date Rated

Ext	Date Reviewed
Reviewed By	Date Reviewed

Applicable Regulations or Policies

M&I, Infrastructure, 40: Poor interface design, not standard hardware, spare parts problem.

M&I, Mission Capability, 35: System does not provide unique alarm identification.

M&I, Asset Condition, 50: System in poor condition, maintenance intensive, mostly doesn't work.

Additional Information & Affected Projects

Shaded Areas Are Not For Use

WHC-SD-W314-ES-018, Rev 0

CAMP RATING FORM

Project Title: SY Tank Farm Tank Waste High Level Alarm Subsystem

B&R Code: _____ Rev #: 0 FY: 1996

Project Id #: SY.I1.7 FUDS: _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.				
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics	45			
Criticality				
Infrastructure				40
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				55
Asset Condition				55
National Business Strategies/Partnerships				
Highest of Each Subcategory	45	20	20	55

PROJECT RATING:	57
Final Project Rating	57

Note: 20 is a Default Rating

C. D. Acree		9/18/95
Rated By	Ext	Date Rated

Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

M&I, Asset Condition, 55: Aging system, equipment similar to Leak Detection System.
M&I, Mission Capability, 55: System is not intrinsically safe, not suitable for flammable gas environment

Additional Information & Affected Projects

H&S, Health Physics, 45: Probe maintenance will expose workers to radiation.
M&I, Infrastructure, 40: Maintenance of probe is difficult.

WHC-SD-W314-ES-018, Rev 0

CAMP RATING FORM

Project Title: SY DST DIFFERENTIAL PRESSURE INSTR. SUBSYSTEM

B&R Code: _____ Rev #: 0 FY: 1996

Project Id #: SY.I2.1.1 FUDS: _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.				
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics				
Criticality				
Infrastructure				40
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				50
Asset Condition				40
National Business Strategies/Partnerships				
Highest of Each Subcategory	20	20	20	50

PROJECT RATING:	50
Final Project Rating	50

Note: 20 is a Default Rating

C. D. Acree		9/22/95
Rated By	Ext	Date Rated
Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

M&I, Asset Condition, 40: Equipment is obsolete (50 yr old design), spare parts availability concern.
M&I, Capability, 50: Recorders are significant maintenance effort. Pressure data is not automatically sent to electronic database.

Additional Information & Affected Projects

M&I, Asset Condition, 40: Some tubing deterioration concerns.
M&I, Infrastructure, 40: Continuous user of instrument air.

WHC-SD-W314-ES-018, Rev 0

CAMP RATING FORM

Project Title: SY Tank Farm/Primary Ventilation/Regulated Stack Monitoring System

B&R Code: _____ Rev #: 0 FY: 1996

Project Id #: SY.12.1.8 FUDS: _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.		55		
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics	45			
Criticality				
Infrastructure				40
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				55
Asset Condition				45
National Business Strategies/Partnerships				
Highest of Each Subcategory	45	55	20	55

PROJECT RATING: 60
Final Project Rating 60
Note: 20 is a Default Rating

Rated By C. D. Acree Ext _____ Date Rated 9/29/95

Reviewed By _____ Ext _____ Date Reviewed _____

Applicable Regulations or Policies

ER/WM, Compliance, 55: System is not compliant with regulatory requirements.
M&I, Mission Capability, 55: System can not detect at required limits, systems does not detect other required gaseous emissions. Not latest recommended site standard CAM

Additional Information & Affected Projects

M&I, Asset condition, 45: Aging system, difficult to lift/maintain.
H&S, Health Physics, 45: Potential radiation exposure to maintenance personnel.
M&I, Infrastructure, 40: Aging system, difficult to status HVAC system.

WHC-SD-W314-ES-018, Rev 0
CAMP RATING FORM

Project Title: SY Tank Farm/Waste Flow Monitoring Inst./Service Pit Inst.

B&R Code: _____ **Rev #:** 0 **FY:** 1996

Project Id #: SY.I3.5.1 **FUDS:** _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.				
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics				
Criticality				
Infrastructure				
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				45
Asset Condition				40
National Business Strategies/Partnerships				
Highest of Each Subcategory	20	20	20	45

PROJECT RATING: 45

Final Project Rating 45

Note: 20 is a Default Rating

<u>C. D. Acree</u>		<u>9/18/95</u>
Rated By	Ext	Date Rated

Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

M&I, Capability, 45: Flow meter cannot measure low flows.
M&I, Asset Condition, 40: Aging system,

Additional Information & Affected Projects

WHC-SD-W314-ES-018, Rev 0

CAMP RATING FORM

Project Title: SY DST WASTE; THERMOCOUPLE TREES, (SY-102 & SY-103)

B&R Code: _____ Rev #: _____ FY: _____

Project Id #: SY.I4.1 FUDS: _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.				
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics	40			
Criticality				
Infrastructure				40
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				40
Asset Condition				35
National Business Strategies/Partnerships				
Highest of Each Subcategory	40	20	20	40

PROJECT RATING:	43
Final Project Rating	43

Note: 20 is a Default Rating

C. D. Acree	9/22/95
Rated By	Date Rated

Reviewed By	Date Reviewed

Applicable Regulations or Policies

M&I, Capability, 40: Elements can not be calibrated. Elements spaced at 2 ft intervals limit capability. Iron lead is subject to corrosion. Note: Probe may not withstand mixer pump forces.
H&S, Health Physics, 40: Probe maintenance will expose workers to radiation.

Additional Information & Affected Projects

M&I, Infrastructure, 40: Elements are not replaceable, probe is not maintainable.
M&I, Asset Condition, 35: Equipment is old, but functional

Shaded Areas Are Not For Use

WHC-SD-W314-ES-018, Rev 0 **CAMP RATING FORM**

Project Title: SY DST WASTE; SPECIFIC GRAVITY INST. SUBSYSTEM

B&R Code: _____ **Rev #:** _____ **FY:** _____

Project Id #: SY.I4.3.1 **FUDS:** _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.				
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics	35			
Criticality				
Infrastructure				40
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				40
Asset Condition				40
National Business Strategies/Partnerships				
Highest of Each Subcategory	35	20	20	40

PROJECT RATING:	42
Final Project Rating	42

Note: 20 is a Default Rating

<u>C. D. Acree</u>		<u>9/22/95</u>
Rated By	Ext	Date Rated
Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

M&I, Asset Condition, 40: Equipment is obsolete (50 yr old design). Spare parts may not be available soon.
 System functionality is marginal. System has maintenance problems.
 M&I, Infrastructure, 40: System is a continuous user of instrument air.

Additional Information & Affected Projects

H&S, Health Physics, 35: Maintenance of system may expose workers to radioactivity.

WHC-SD-W314-ES-018, Rev 0

CAMP RATING FORM

Project Title: SY DST WASTE; FIC LIQUID SURFACE LEVEL INST. SUBSYSTEM

B&R Code: _____ Rev #: _____ FY: _____

Project Id #: SY.14.4 FUDS: _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.				
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics	35			
Criticality				
Infrastructure				50
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				60
Asset Condition				60
National Business Strategies/Partnerships				
Highest of Each Subcategory	35	20	20	60

PROJECT RATING:	61
Final Project Rating	61

Note: 20 is a Default Rating

C. D. Acree		9/29/95
Rated By	Ext	Date Rated

Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

M&I, Asset Condition, 60: FIC gauges are inoperative. Extensive maintenance is normally required.
M&I, Capability, 60: FIC Gauges have poor resolution.
M&I, Infrastructure, 50: Poor resolution of FIC gauges exacerbates mass balance computation
for checking waste transfer operations.

Additional Information & Affected Projects

H&S, Health Physics, 35: Maintenance of the FIC may expose workers to radiation.
M&I, Infrastructure, 50: Future spare parts problem.

Shaded Areas Are Not For Use

WHC-SD-W314-ES-018, Rev 0
CAMP RATING FORM

Project Title: SY Tank Farm/Pipeline Heat Trace I&C Subsystem

B&R Code: _____ Rev #: 0 FY: 1996

Project Id #: SY.17 FUDS: _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.				
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics				
Criticality				
Infrastructure				40
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				40
Asset Condition				50
National Business Strategies/Partnerships				
Highest of Each Subcategory	20	20	20	50

PROJECT RATING: 50

Final Project Rating 50

Note: 20 is a Default Rating

C. D. Acree		9/29/95
Rated By	Ext	Date Rated

Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

M&I, Asset Condition, 50: Some Pipelines have broken heat trace heaters.

M&I, Capability, 40:

M&I, Infrastructure, 40: Lack of pipe heating may affect transfer capability on some pipelines.

Additional Information & Affected Projects

9.0 244-A DCRT

9.1 PDRD Cross Reference Tables

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PROJECT W-314 PDRD CROSS REFERENCED TABLE INSTRUMENT & CONTROL SYSTEMS				
PDRD FUNCTION ID#	PDRD FUNCTION VERB	PDRD DATA VARIABLE	EQUIPMENT REFERENCE TREE	COMMENTS
3.2.1.1.1.1	Monitor	Hydroxide conc. Nitrate concentration Nitrite concentration Sodium concentration Specific Gravity	Non-existent architecture Non-existent architecture Non-existent architecture Non-existent architecture DA.14.3.1	Manual Sampling, Lab. Analysis function. Sp-G uses a Weight Factor bubbler system.
3.2.1.1.1.1.2	Compare	Hydroxide conc. Nitrate concentration Nitrite concentration	Non-existent architecture Non-existent architecture	Lab. Analysis function
3.2.1.1.1.2.1.2	Compare	Specific Gravity	Non-existent architecture	Administrative function,
3.2.1.1.1.2.1.3	Compare	Sodium concentration	Non-existent architecture	Lab. Analysis function
3.2.1.1.1.2.1.4	Compare	PU concentration	Non-existent architecture	Lab. Analysis function
3.2.1.1.1.3	Alarm	Waste composition	Non-existent architecture	Administrative function
3.2.1.1.1.4	Control	Waste composition	Non-existent architecture	Administrative function
3.2.1.1.1.5	Monitor	Supernate Liquid Level	DA.14.4.2	A direct reading waste liquid level is not provided. This data is derived from the SpG-WF pneumatic system.
3.2.1.1.1.6	Compare	Supernate Liquid Level	DA.14.4.2	Alarm system is part of pneumatic system.
3.2.1.1.1.7	Alarm	Supernate Liquid Level	DA.14.4.2	Alarm system is part of pneumatic system.
3.2.1.1.1.8	Control	Supernate Liquid Level	Not Assessed DA.13.1	Administrative function, manual pump control.
3.2.1.1.1.9	Monitor	Waste Temperature	DA.14.1	No gradient temperature measurement is provided.
3.2.1.1.1.10	Compare	Waste Temperature	Not Assessed	
3.2.1.1.1.11	Alarm	Waste Temperature	Not Assessed	

PROJECT W-314 PDRD CROSS REFERENCED TABLE INSTRUMENT & CONTROL SYSTEMS				
PDRD FUNCTION ID#	PDRD FUNCTION VERB	PDRD DATA VARIABLE	EQUIPMENT REFERENCE TREE	COMMENTS
3.2.1.1.1.12 3.2.1.2.1.1	Control	Waste Temperature (indirectly) Ventilation System Airflow	Not Assessed re: DA.12.1.5	Administrative function Manual adjustment required
3.2.1.1.1.13	Monitor	Waste Level	DA.14.4.3	Waste Liquid Level is derived from SpG-WF system and is derived from pressure.
3.2.1.1.1.14	Compare	Waste Level	DA.14.4.3	
3.2.1.1.1.15	Alarm	Waste Level	DA.14.4.3	
3.2.1.1.1.16	Control	Waste Level	Not Assessed re: DA.13.1	Administrative function
3.2.1.1.1.17(1)	Monitor	Leak Det. Pit Radiation Level	Non-existent architecture	Facility does not provide "Leak Detection Pits".
3.2.1.1.1.17(1)	Monitor	Leak Det. Pit Temperature	Non-existent architecture	
3.2.1.1.1.17(1)	Monitor	Leak Det. Pit Waste Level	Non-existent architecture	
3.2.1.1.1.17(2)	Monitor	Tank Annulus Radiation Level	DA.11.2.1	CAM is old style ALPHA 3.
3.2.1.1.1.17(2)	Monitor	Tank Annulus Liquid Presence/Level	DA.11.2.2	Uses SpG-WF pneumatic to measure liquid level.
3.2.1.1.1.18	Compare	Leak Det. Pit Radiation Level	Non-existent architecture	
3.2.1.1.1.18	Compare	Leak Det. Pit Temperature	Non-existent architecture	Trade Study should reassess the need for this instrument. Suggest deletion and revised PDRD.
3.2.1.1.1.18	Compare	Leak Det. Pit Water Level	Non-existent architecture	
3.2.1.1.1.18	Compare	Tank Annulus Radiation Level	DA.11.2.1.4	The 242-A Evaporator computer provides this function.

PROJECT W-314 PDRD CROSS REFERENCED TABLE INSTRUMENT & CONTROL SYSTEMS				
PDRD FUNCTION ID#	PDRD FUNCTION VERB	PDRD DATA VARIABLE	EQUIPMENT REFERENCE TREE	COMMENTS
3.2.1.1.1.18	Compare	Tank Annulus Liquid Presence/Level	DA.11.2.2	This function is provided by the old pneumatic system.
3.2.1.1.1.19	Alarm	Leakage From Tank Bottom	DA.11.2.1.4 DA.11.2.2.5	242-A Evaporator computer provides this function.
3.2.1.1.1.19	Alarm	Leakage From Tank Annulus	Non-existent architecture	242-A Evaporator computer provides this function.
3.2.1.1.1.20	Control	Leakage From Tank Bottom	Non-existent architecture	Administrative function
3.2.1.1.1.20	Control	Leakage From Tank Annulus Bottom	Non-existent architecture	
3.2.1.1.1.21	Monitor	Leak Det. Pit Liquid Level	Non-existent architecture	
3.2.1.1.1.22	Compare	Leak Det. Pit Liquid Level	Non-existent architecture	
3.2.1.1.1.23	Alarm	Leak Det. Pit Liquid Level	Non-existent architecture	
3.2.1.1.1.24	Control	Leak Det. Pit Liquid Level	Non-existent architecture	
3.2.1.1.1.25	Monitor	Tank Vapor Space Temperature Gradient	Non-existent architecture (re: DA.14.1)	Data should be connected to TMACS.
3.2.1.1.1.26	Compare	Tank Vapor Space Temperature Gradient	Non-existent architecture	
3.2.1.1.1.27	Alarm	Tank Vapor Space Temperature Gradient	Non-existent architecture	

PROJECT W-314 PDRD CROSS REFERENCED TABLE INSTRUMENT & CONTROL SYSTEMS				
PDRD FUNCTION ID#	PDRD FUNCTION VERB	PDRD DATA VARIABLE	EQUIPMENT REFERENCE TREE	COMMENTS
3.2.1.1.1.28	Control	Tank Vapor Space Temperature Gradient	Non-existent architecture	
3.2.1.1.1.29	Monitor	Tank [Concrete] Structure Temperature	Non-existent architecture	
3.2.1.1.1.30	Compare	Tank [Concrete] Structure Temperature	Non-existent architecture	
3.2.1.1.1.31	Alarm	Tank [Concrete] Structure Temperature	Non-existent architecture	
3.2.1.1.1.32 3.2.1.2.1.1.2	Control	Tank [Concrete] Structure Temperature (indirectly) Ventilation System Airflow	Non-existent architecture	
3.2.1.1.1.33	Monitor	Tank Vapor Space Pressure	DA.I2.1.1.2 DA.I2.1.1.5	This measurement is obtained from the in-tank SpG-WF system.
3.2.1.1.1.34	Compare	Tank Vapor Space Pressure	DA.I2.1.1.4	
3.2.1.1.1.35	Alarm	Tank Vapor Space Pressure	DA.I2.1.1.4	
3.2.1.1.1.36	Control	Tank Vapor Space Pressure	Not Assessed	Administrative function. Trade Study should assess need for automation.
3.2.1.1.1.37	Monitor	Tank Flammable Gas Concentration	Non-existent architecture	PDRD needs to better define this requirement for the DCRT.
3.2.1.1.1.38	Compare	Tank Flammable Gas Concentration	Non-existent architecture	

PROJECT W-314 PDRD CROSS REFERENCED TABLE INSTRUMENT & CONTROL SYSTEMS				
PDRD FUNCTION ID#	PDRD FUNCTION VERB	PDRD DATA VARIABLE	EQUIPMENT REFERENCE TREE	COMMENTS
3.2.1.1.1.39	Alarm	Tank Flammable Gas Concentration	Non-existent architecture	
3.2.1.1.1.40 3.2.1.2.4 3.2.1.2.5	Control (Maintain, Adjust)	Tank Flammable Gas Concentration Tank Ventilation System Airflow	Not Assessed re: DA.12.1.5 & DA.12.1.6	Administrative function.
3.2.1.1.1.41	Monitor	Untreated Gaseous Effluent Temperature	DA.12.1.3	
3.2.1.1.1.42	Monitor	Treated Gaseous Effluent Radionulide Particulate Concentrations	DA.12.1.8	
3.2.1.1.1.42	Monitor	Treated Gaseous Effluent Temperature	DA.12.1.8	Normally part of the stack monitor system.
3.2.1.1.1.42	Monitor	Treated Gaseous Effluent Moisture level	Non-existent architecture	
3.2.1.1.1.42	Monitor	Treated Gaseous Effluent Organic Vapor Concentration	Non-existent architecture	
3.2.1.1.1.42	Monitor	Treated Gaseous Effluent Hazardous/ Toxic Vapor - Particulate Concentrations	Non-existent architecture	

PROJECT W-314 PDRD CROSS REFERENCED TABLE INSTRUMENT & CONTROL SYSTEMS				
PDRD FUNCTION ID#	PDRD FUNCTION VERB	PDRD DATA VARIABLE	EQUIPMENT REFERENCE TREE	COMMENTS
3.2.1.1.1.43(1)	Compare	Treated Gaseous Effluent Radionuclide Particulate Concentrations	DA.12.1.8 See HVAC Assessment	
3.2.1.1.1.43	Compare	Treated Gaseous Effluent Temperature	DA.12.1.8	
3.2.1.1.1.43	Compare	Treated Gaseous Effluent Moisture Level	Non-existent architecture	
3.2.1.1.1.43	Compare	Treated Gaseous Effluent Organic Vapor Concentration	Non-existent architecture	
3.2.1.1.1.43(2)	Compare	Treated Gaseous Effluent Hazardous/ Toxic Vapor - Particulate Concentrations	Non-existent architecture	
3.2.1.1.1.44	Alarm	Treated Gaseous Effluent Radionuclide Particulate Concentrations	DA.12.1.9	Recorders function is in 242-A Evaporator computer and should be replaced.
3.2.1.1.1.44	Alarm	Treated Gaseous Effluent Temperature	Not Assessed	
3.2.1.1.1.44	Alarm	Treated Gaseous Effluent Moisture Level		

PROJECT W-314 PDRD CROSS REFERENCED TABLE INSTRUMENT & CONTROL SYSTEMS				
PDRD FUNCTION ID#	PDRD FUNCTION VERB	PDRD DATA VARIABLE	EQUIPMENT REFERENCE TREE	COMMENTS
3.2.1.1.1.44	Alarm	Treated Gaseous Effluent Organic Vapor Concentration	Non-existent architecture	
3.2.1.1.1.44	Alarm	Treated Gaseous Effluent Hazardous/ Toxic Vapor - Particulate Concentrations	Non-existent architecture	
3.2.1.1.1.45	Control	Treated Gaseous Effluent Radionuclide Particulate Concentrations	Non-existent architecture	Administrative function.
3.2.1.1.1.45	Control	Treated Gaseous Effluent Temperature	Non-existent architecture	Administrative function.
3.2.1.1.1.45 3.2.1.2.7	Control	Treated Gaseous Effluent Moisture Level (indirectly) Tank Ventilation System	Non-existent architecture	Administrative function.
3.2.1.1.1.45	Control	Treated Gaseous Effluent Organic Vapor Concentration	Non-existent architecture	Administrative function.
3.2.1.1.1.45 3.2.1.2.8	Control	Treated Gaseous Effluent Hazardous/ Toxic Vapor - Particulate Concentrations (indirectly) Tank Ventilation System	Non-existent architecture	Administrative function.

PROJECT W-314 PDRD CROSS REFERENCED TABLE INSTRUMENT & CONTROL SYSTEMS				
PDRD FUNCTION ID#	PDRD FUNCTION VERB	PDRD DATA VARIABLE	EQUIPMENT REFERENCE TREE	COMMENTS
3.2.1.1.2.2	Monitor	Essential Transfer Tank Systems/Equipment Operability Status (eg. vent. sys., waste level monitor, etc)	Not Assessed	Presently, Operator rounds required.
3.2.1.1.2.3	Monitor	Essential Interconnecting Systems/Equipment Operability Status (eg. heat trace, valves, pumps, etc)	DA.I6, Not Assessed	Presently, Operator rounds required.
3.2.1.1.2.4	Monitor	Transfer System Operability Status (leak detection system)	DA.I1.3 DA.I1.4	
3.2.1.1.2.5	Monitor	Essential Equipment Operability Status	DA.I6	Presently, Operator rounds required.
3.2.1.1.2.6	Monitor	Waste Parameters Temperature Viscosity Specific Gravity	DA.I4 DA.I4.1 DA.I4.3	Trade Study needs to assess requirement for the DCRT.
3.2.1.1.2.7	Detect	Waste Transfer System Containment Leaks	DA.I1.3	
3.2.1.1.2.8	Monitor	Effluents	Non-existent architecture	No effluents in the Tank Farm. Service pit monitors water flow for washdown.
3.2.1.1.2.9	Monitor	Motive Force	(re: DA.I3.1) See Electrical Assessment	Manual ON-OFF control, location indicators of ON-OFF condition.
3.2.1.1.2.9	Control	Motive Force	See Electrical Assessment (re: DA.I3.1)	Manual ON-OFF control, Only current monitoring of pump exists.

PROJECT W-314 PDRD CROSS REFERENCED TABLE INSTRUMENT & CONTROL SYSTEMS				
PDRD FUNCTION ID#	PDRD FUNCTION VERB	PDRD DATA VARIABLE	EQUIPMENT REFERENCE TREE	COMMENTS
3.2.1.1.2.10	Monitor	Transfer Route Isolation Devices	I&C Non-existent architecture (re: DA.I3.3) See Pipeline Assessment	Manual Indication.
3.2.1.1.2.10	Control	Transfer Route Isolation Devices	I&C Non-existent architecture (re: DA.I3.3) See Pipeline Assessment	Manual Operation.
3.2.1.1.2.11	Monitor	Transfer Line Waste Flow Rate	Non-existent architecture	
3.2.1.1.2.12	Monitor & Compare (Verify)	Transfer Volume	Non-existent architecture	Administrative function.
3.2.1.1.2.13	Alarm (Annunciate)	Waste Transfer System-Structure- Component Fault(s)	DA.I1.5	Administrative function. Alarm Status assessed via Operator rounds & via CASS reports.
3.2.1.1.14	Control (Activate)	Waste Transfer Safe Shutdown Systems	DA.I1.4	
3.2.1.1.2.15	Monitor & Compare (Verify)	Waste Transfer System Safe Shutdown	Non-existent architecture	Function not implemented with existing I & C.
3.2.1.1.2.16	Control (Secure)	Failed Waste Transfer System Equipment	Non-existent architecture	Function not implemented with existing I & C.
3.2.1.1.3	Manage Obtain Analyze Process Store Archive	System Data/Information	DA.I1.2.1.4 DA.I2.1.1.5 DA.I1.6 (DA.I4.4.5)	Recorder function moved to 242-A Evaporator computer. Trade study should assess need/desire to move this function and monitoring to the TMACS Central computer system.
3.2.1.2.3.1	Monitor	Tank Annulus Pressure	DA.I2.2.1 (See HVAC Assessment)	Existing equipment is manual.

PROJECT W-314 PDRD CROSS REFERENCED TABLE INSTRUMENT & CONTROL SYSTEMS					
PDRD FUNCTION ID#	PDRD FUNCTION VERB	PDRD DATA VARIABLE	EQUIPMENT REFERENCE TREE	COMMENTS	
3.2.1.2.3.1	Control (Maintain)	Tank Annulus Pressure	Not Assessed	Manual operator function.	
3.2.1.3.4	Monitor	Waste Transfer System Containment Pressure	(DA.13.4) Not Assessed See Pipeline Assessment		
3.2.1.3.4	Control	Waste Transfer System Containment Pressure	Not Assessed See Pipeline Assessment		
3.3.1.2.3.1	Monitor	Sludge Volume	DA.14.5 Not Assessed	PDRD needs to clarify requirement for DCRT.	
3.3.4.1.6	Monitor	CAMs Radiation Remote Centralized Data & Alarm Display	Not Assessed	Personnel protection monitoring is not monitored by TMACS. PDRD needs to clarify data display needs.	

9.2 Functions Assessment Tables

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**EXISTING TANK FARM EQUIPMENT
FUNCTIONS ASSESSMENT TABLE**
INSTRUMENTS & CONTROL SYSTEMS

REF. NO	SYSTEM NAME	FUNCTION OR CONSTRAINT			METHOD OF ANALYSIS I. Analysis II. Inspection III. Testing	BRIEF REASON FOR DECISION
		DESCRIPTION	SOURCE	MET		
DA.11	LEAK CONTROL SYSTEM	3.2.1.1.2.4 3.2.3.3 3.2.3.4	PDRD	NO	I. See the Engineering Analysis.	Verification of the operability of the transfer route leak sensors is not reliable because of the design of the liquid presence sensors and the manual process utilized to test each sensor. These sensors cannot be calibrated.
DA.11.2	ANNULUS LEAK INSTRUMENTATION	Secondary Containment Leak Detection	40CFR-CH1-#265.193(c)(3), WAC-173-303	NO	I. See the Engineering Analysis.	Leakage from secondary tank walls may be absorbed in the soil. (Secondary containment floor leaks may be detected by the Leak Detection Pit systems.)
DA.11.2.1	CAM Radiation Monitoring Subsystem (RIAS-A)	3.2.1.1.1.17	PDRD 40CFR-CH1-#265.193(c)(3), WAC-173-303	NO	I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	This system is not reliable. The equipment is not protected from the environment. The installation is inadequate and does not embody good engineering principles. A Trade Study should be carried out to determine the best equipment for this function.
DA.11.2.2	Weight Factor & Specific Gravity Monitoring System	3.2.1.1.1.17	PDRD WAC-173-303-#160(d)(iii), 40CFR-CH1-#265.193(c)(3)	NO	I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	In order for this system to work, there must be a level of liquid maintained in the annulus. This runs counter to basic leak detection technology. In that a liquid level is being maintained in the annulus. The air in the annulus sump is common to the air in the balance of the annulus. In DST the annulus is supposed to remain dry so that a leakage will (dry and flake off particulate) activate the annulus CAM. The WF-SpG system seems to disable this capability. Maintenance of this liquid level requires Operator intervention. This is complex pneumatic technology that does not directly measure liquid level. Liquid level changes must be calculated from pressure measurements which are related to weight factor - specific gravity and last know water additions. Better instrumentation exists that does not use instrument air. There is a potential for unreliable operation if the instrument air quality degrades.

EXISTING TANK FARM EQUIPMENT FUNCTIONS ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS						
REF. NO	SYSTEM NAME	FUNCTION OR CONSTRAINT			METHOD OF ANALYSIS I. Analysis II. Inspection III. Testing	BRIEF REASON FOR DECISION
		DESCRIPTION	SOURCE	MET		
DA.11.3	PIPELINE LEAK INSTRUMENTATION	3.2.1.1.2.7 Secondary Containment Leak Detection	PDRD WAC-173- 303#160(4)(c)(iii) 40CFR- CH1 #265.193(c)(3)	NO	I. See the Engineering Analysis.	The leak detection cannot detect a failure of pipeline secondary containment. The leak detection system cannot detect a failure of the "Transfer Pits". A Trade Study should pull together the various environmental interpretation, permits and waiver requests to confirm the need for this type of system.
DA.11.3.3	Encasement Instruments; Seal Pots (Liquid Presence Sensors)	3.2.1.1.2.7	PDRD WAC-173-303- #160(4)(c)(iii), 40CFR-Ch1- #265.193(c)(3)	NO	I. See the Engineering Analysis.	The existing sensor will not detect low leak rates due to its design. Its operability cannot be easily verified. It cannot be functionally tested with existing electrical circuitry. Current sensitive relays are not (& cannot be) calibrated with the sensor.
DA.11.3.5	Pump Pit Instruments (LDE only)	3.2.1.1.2.7	PDRD	NO	I. See the Engineering Analysis.	See DA.11.3.3
DA.11.4	PUMP PERMISSIVE INSTRUMENTATION (Master Pump shutdown)	3.2.1.1.2.9 3.2.1.1.2.10 3.2.1.3.10	PDRD	NO	I. See the Engineering Analysis.	The existing system does not allow interlock versatility. (Its all or nothing.) You can not set up a transfer route and have only the appropriate leak sensors for that route active.
DA.11.5	LOCAL ALARM ANNUNCIATION & ALARM PANELS	3.2.1.1.2.2 3.2.1.1.2.3 3.2.1.1.2.4 3.2.1.1.2.5 3.2.1.1.2.13 3.2.1.1.3	PDRD	-	Not assessed.	Most of the alarm instrumentation and some of the analog instrumentation has been connected to 242-A Evaporator computer system. Replacement of instrumentation systems may render these connection non-functional.
DA.12	VENTILATION CONTROL SYSTEM					
DA.12.1	TANK PRIMARY VENTILATION SYSTEM					

**EXISTING TANK FARM EQUIPMENT
FUNCTIONS ASSESSMENT TABLE**
INSTRUMENTS & CONTROL SYSTEMS

REF. NO.	SYSTEM NAME	FUNCTION OR CONSTRAINT			METHOD OF ANALYSIS I. Analysis II. Inspection III. Testing	BRIEF REASON FOR DECISION
		DESCRIPTION	SOURCE	MET		
DA.12.1.1	Tank Diff. Pressure Instr. Subsystem (part of WF-SpG system)	3.2.1.1.1.33 3.2.1.1.1.34 3.2.1.1.1.35	PDRD	NO	I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets. See DA.14.3.1	This system is not separable from the other pneumatic system referenced.
DA.12.1.2	HEPA Filter Diff. Pressure Instr.	3.2.1.2.9 3.2.3	PDRD	NO	I. See the Engineering Analysis.	Record keeping of filter degradation requires manual data gathering. No electronic database capability is available. (HVAC section will give further guidance.)
DA.12.1.3	Temperature Instrumentation	3.2.1.1.1.41 3.2.3	PDRD	NO	I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	Wiring is unsecured and not rated for exterior use. Record keeping of filter degradation requires manual data gathering. No electronic database capability is available. HVAC section will give further guidance.
DA.12.1.4	Heater Control Subsystem	3.2.1.1.1.41	PDRD	NO	I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	Heater controls require extensive maintenance, and cannot be calibrated. Temperature probes have high failure rates.
DA.12.1.5	Fan-Motor Control Subsystem	3.2.1.2.9 3.2.1.2.10 3.2.3	PDRD	YES ¹	I. See the Engineering Analysis.	¹ Automatic data acquisition for controls position should be considered.
DA.12.1.6	Damper Control Subsystem	3.2.1.2.10	PDRD	YES ¹	I. See the Engineering Analysis.	¹ Automatic data acquisition for controls position should be considered.
DA.12.1.9	Stack Monitoring System ()	3.2.1.1.1.42	PDRD	NO	I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	Although this is not a regulated stack at this time, the installation is poor. The CAM is difficult to maintain and calibrate. This system is too sensitive to Radon gas, which yield excessive false alarms.
DA.12.2	TANK ANNULUS VENTILATION SYSTEM					
DA.12.2.1	Annulus Diff. Pressure Subsystem	3.2.1.2.3.1	PDRD	NO	I. See the Engineering Analysis.	The existing system is manually read in the farm. The interaction between the primary ventilation system and the annular ventilation system on the primary tank well must be manually computed.

**EXISTING TANK FARM EQUIPMENT
FUNCTIONS ASSESSMENT TABLE**
INSTRUMENTS & CONTROL SYSTEMS

REF. NO	SYSTEM NAME	FUNCTION OR CONSTRAINT			METHOD OF ANALYSIS I. Analysis II. Inspection III. Testing	BRIEF REASON FOR DECISION
		DESCRIPTION	SOURCE	MET		
DA.13	TRANSFER LINE CONTROL SYSTEM	3.2.1.1.2.5 3.2.1.1.2.8	PDRD	NO	I. See the Engineering Analysis.	Effluents are not monitored.
DA.13.1	PUMP CONTROL SUBSYSTEM	3.2.1.1.2.9	PDRD	NO	I. See the Engineering Analysis.	Monitoring of Motive Force Devices consists of current monitoring. On/Off status is not monitored. Pump permissive via the M.P.S system is complex and not separable.
DA.13.2	VALVE POSITION INDICATION/ INDICATION (No electrical Sys.)	3.2.1.1.2.10	PDRD	NO	I. See the Engineering Analysis.	Electronic Feedback of route isolation status does not exist. Transfer route identification cannot be electronically verified because valve position is not remotely monitored. Limit switches are problematic, but new technology exists which could provide continuous position indication.
DA.13.3	VALVE CONTROL SYSTEM (No automation)	3.2.1.1.2.10	PDRD	YES	I. See the Engineering Analysis.	MotORIZED valve control is utilized for major transfer routes.
DA.13.5	WASTE FLOW MONITORING INSTRUMENTATION (RIAS-SP in Service Pt)	3.2.1.1.2.11	PDRD	NO	I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	Waste Flow Inst. does not exist. This radiation monitoring system is not reliable. The equipment is not protected from the environment. The installation is inadequate and does not embody good engineering principles.
DA.14	TANK CONTENTS MONITORING SYSTEM	3.2.1.1.2.6	PDRD			The PDRD should clarify the requirement for this function. The PDRD should clarify the type of data needed for this function.
DA.14.1	TEMPERATURE INSTRUMENTATION Thermocouple Probe	3.2.1.1.1.9 3.2.1.1.1.25 3.2.1.2.1.1	PDRD	NO	I. See the Engineering Analysis.	Only one temperature sensor is installed in the tank. There is no capability for temperature gradient measurement.
DA.14.3	CHEMICAL COMPOSITION INSTRUMENTATION	3.2.1.1.1.1 3.2.1.1.1.2.1.1 3.2.1.1.1.2.1.2	PDRD	NO	I. See the PDRD Cross Ref.	An installed chemical analyzer does not exist. This is a manual effort, analysis by laboratory & is infrequently done. Risers will need to be dedicated for this device if frequent analysis is required. The PDRD should clarify the sampling frequency for each data type.

EXISTING TANK FARM EQUIPMENT FUNCTIONS ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS						
REF. NO	SYSTEM NAME	FUNCTION OR CONSTRAINT			METHOD OF ANALYSIS I. Analysis II. Inspection III. Testing	BRIEF REASON FOR DECISION
		DESCRIPTION	SOURCE	MET		
DA.14.3.1	TK-244-A Weight Factor & Specific Gravity Instrumentation (also supplies tank pressure and tank level).	3.2.1.1.1.2.1.2	PDRD	NO	I. See the Engineering Analysis.	Density is not measured directly, but is calculated from air pressure measurements. Dip tubes have a history of plugging and have a small leak at this time. Better equipment exists which does not use instrument air. The PDRD should reassess the need for this type of architecture.
DA.14.4	TANK LIQUID SURFACE LEVEL INSTRUMENTATION	3.2.1.1.1.5 3.2.1.1.1.13 3.2.1.1.2.12	PDRD	NO	See DA.14.3.1	This parameter is derived from the WF-SpG measurements. This mixes functionality of liquid level and density. See DA.14.3.1
DA.16	SCC STATUS/MONITORING SYSTEM AC POWER SUPPLY STATUS AIR SUPPLY STATUS WATER SUPPLY STATUS Other	3.2.1.1.2.1 3.2.1.1.2.3	PDRD	NO	I. See the Engineering Analysis. IIa. See the Field Inspection Questionnaire. IIb. See the CAS Data Sheets.	A status summary alarm panel which includes all these subsystems doesn't exist. Some status are available via the 242-A computer system. Replace of the instrument systems may render much of the old PANALARM system non-functional.

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9.3 Architecture Tree Tables

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Level 1

Level 2

Level 2

Level 2

Level 2

Level 3

Level 4

Level 2

LEAK CONTROL
SYSTEM
DA.11

Level 3

ANNULUS LEAK
INSTRUMENTATION
DA.11.2

Level 4

CAM Radiation
Monitoring
Subsystem
DA.11.2.1

Level 5

Air Sampler
Probe/Tubing/etc
DA.11.2.1.1

Radiation
Analyzer
DA.11.2.1.2

Cabinet
DA.11.2.1.3

3-Pen Recorder
& Alarms
(242-A)
DA.11.2.1.4

Signal
Wiring/Conduit
DA.11.2.1.5

Level 2

Level 3

Level 4

Level 5

Level 2

Level 3

Level 4

Level 2

Level 3

Level 4

Level 2

Level 3

Level 4

Level 2

Level 2

VENTILATION
CONTROL SYSTEM
DA.12

Level 3

TANK PRIMARY
VENTILATION
SYSTEM
DA.12.1

Level 4

Tank
Diff. Pressure
Inst. Subsystem
DA.12.1.1

HEPA Filter
Diff. Pressure
Instrumentation
DA.12.1.2

Temperature
Instrumentation
(Differential)
DA.12.1.3

Heater
Control
System
12.1.4

Fan - Motor
Control
System
DA.12.1.5

Level 4

Damper
Control
Subsystem
DA.12.1.6

reserved

Regulated Stack
Monitoring
System
(296-A-25)
DA.12.1.9

Level 2

VENTILATION
CONTROL SYSTEM
DA.12

Level 3

TANK PRIMARY
VENTILATION
SYSTEM
DA.12.1

Level 4

Tank Pressure
Inst. Subsystem
(part of WF-SpG)
DA.12.1.1

Level 5

Tank Riser Tubing
to Pressure
Sensor/Transmitter
DA.12.1.1.1

Pressure
Sensor/Transmitter
DA.12.1.1.2

Pressure
Switch/Alarm
DA.12.1.1.4

Pressure
Recorder
(242-A)
DA.12.1.1.5

Level 2

VENTILATION
CONTROL SYSTEM
DA.12

Level 3

TANK PRIMARY
VENTILATION
SYSTEM
DA.12.1

Level 4

Regulated Stack
Monitoring
System
DA.12.1.9

Level 5

Tubing from Stack
to CAM
DA.12.1.9.1

CAMs
DA.12.1.9.2

CAM Cabinets
DA.12.1.9.3

Vacuum Pumps
DA.12.1.9.4

Pen
Recorder
(242-A)
DA.12.1.9.5

Level 2

VENTILATION
CONTROL SYSTEM
DA.12

Level 3

TANK ANNULUS
VENTILATION
SYSTEM
DA.12.2

Level 4

Annulus
Diff. Pressure
Inst. Subsystem
DA.12.2.1

Level 2

Level 2

Level 3

Level 2

Level 3

Level 4

Level 2

Level 3

Level 4

Level 2

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9.4 Drawing Reference Tables

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EXISTING TANK FARM EQUIPMENT SYSTEM DRAWING REFERENCES INSTRUMENTS & CONTROL SYSTEMS				
REF NO.	SYSTEM NAME	DRAWING REFERENCES	NO. OF ECNS OUTSTANDING	PDRD REFERENCE
DA.II	LEAK CONTROL SYSTEM	H-2-38217, H-2-38211	0	1. 3.2.1.1.2.4
DA.II.2	ANNULUS LEAK INSTRUMENTATION	H-2-38217, H-2-38211	0	1. Secondary Containment Leak Detection
DA.II.2.1	CAM Radiation Monitoring Subsystem	H-2-38217	0	1. 3.2.1.1.1.17
DA.II.2.1.1	Air Sampler Probe/ Tubing/ etc	H-2-38217	0	
DA.II.2.1.2	Radiation Analyzer	H-2-38217	0	
DA.II.2.1.3	Cabinet	H-2-38217	0	
DA.II.2.1.4	3-Pen recorder & Alarms (242-A7)	N/A		
DA.II.2.1.5	Signal Wiring/ Conduit	H-2-38208, H-2-38210	4	
DA.II.2.2	Weight Factor & Specific Gravity Monitoring System	H-2-38217	0	
DA.II.2.2.1	Sample Tubes	H-2-38217, H-2-38218	1	
DA.II.2.2.2	Weight Factor & Specific Gravity Pressure Sensors	H-2-38217, H-2-38218	1	
DA.II.2.2.3	Weight Factor Cabinet	H-2-38218	1	
DA.II.2.2.4	reserved			
DA.II.2.2.5	W.F. & SpG Press. Switches & Indicators	H-2-38217, H-2-38218	1	
DA.II.3	PIPELINE LEAK INSTRUMENTATION	H-2-38217, H-2-38211	0	1. 3.2.1.1.2.7 2. Secondary Containment Leak Detection
DA.II.3.3	Encasement Instruments: Seal Pots (Liquid Presence Sensors)	H-2-38217	0	1. 3.2.1.1.2.7
DA.II.3.4	Signal Wiring/ Conduit/ Terminal Boxes	H-2-38208, H-2-38210	4	

EXISTING TANK FARM EQUIPMENT SYSTEM DRAWING REFERENCES INSTRUMENTS & CONTROL SYSTEMS				
REF NO.	SYSTEM NAME	DRAWING REFERENCES	NO. OF ECNs OUTSTANDING	PORD REFERENCE
DA.11	LEAK CONTROL SYSTEM	H-2-38217, H-2-38211	0	1. 3.2.1.1.2.4
DA.11.3.5	Pump Pit Instruments (LDE only)	H-2-38217	0	
DA.11.4	PUMP PERMISSIVE INSTRUMENTATION (Master Pump shutdown)	H-2-38209	0	1. 3.2.1.1.2.9 2. 3.2.1.1.2.10 3. 3.2.1.3.10
DA.11.4.1	Master Pump Shutdown Relay Panel (242-A)	H-2-38209	0	1. 3.2.1.1.2.9 2. 3.2.1.1.2.10 3. 3.2.1.3.10
DA.11.4.3	Signal Wiring/Conduit/TBX	H-2-38208, H-2-38210	4	
DA.11.5	LOCAL ALARM ANNUNCIATOR & ALARM PANELS	H-2-38217	0	1. 3.2.1.1.2.2 2. 3.2.1.1.2.3 3. 3.2.1.1.2.4 4. 3.2.1.1.2.5 5. 3.2.1.1.2.13 6. 3.2.1.1.3
DA.11.5.1	244-A Alarm Panel	H-2-38217	0	
DA.11.5.2	[242-A Alarms]			
DA.12	VENTILATION CONTROL SYSTEM	H-2-38214, H-2-38209	1	
DA.12.1	TANK PRIMARY VENTILATION SYSTEM	H-2-38214, H-2-38209	1	
DA.12.1.1	Tank Diff. Pressure Inst. Subsystem (part of WF-SpG system)	H-2-38217	0	1. 3.2.1.1.1.33 2. 3.2.1.1.1.34 3. 3.2.1.1.1.35
DA.12.1.1.1	<i>Tank Riser Tubing to Pressure Sensor/Transmitter</i>	H-2-38217	0	
DA.12.1.1.2	<i>Pressure Sensor/Transmitter</i>	H-2-38217	0	
DA.12.1.1.4	<i>Pressure Switch/Alarm</i>	H-2-38217	0	
DA.12.1.1.5	<i>Pressure Recorder (242-A)</i>	N/A		
DA.12.1.2	HEPA Filter Diff. Pressure Instr.	H-2-38214	1	
DA.12.1.3	Temperature Instrumentation	H-2-38214	1	1. 3.2.1.1.1.41

EXISTING TANK FARM EQUIPMENT SYSTEM DRAWING REFERENCES INSTRUMENTS & CONTROL SYSTEMS				
REF NO.	SYSTEM NAME	DRAWING REFERENCES	NO. OF ECNs OUTSTANDING	PDRD REFERENCE
DA.11	LEAK CONTROL SYSTEM	H-2-38217, H-2-38211	0	1. 3.2.1.1.2.4
DA.12.1.4	Heater Control Subsystem	H-2-38214, H-2-38209	1	
DA.12.1.5	Fan-Motor Control Subsystem	H-2-38214, H-2-38209	1	
DA.12.1.6	Damper Control Subsystem	H-2-38214	1	
DA.12.1.9	Regulated Stack Monitoring System ()	H-2-95298	0	1. 3.2.1.1.1.42
DA.12.1.9.1	Tubing from Stack to CAM	H-2-95298	0	
DA.12.1.9.2	CAMs	H-2-95298	0	
DA.12.1.9.3	CAM Cabinet	H-2-95298	0	
DA.12.1.9.4	Vacuum Pumps	H-2-95298	0	
DA.12.1.9.5	pen Recorder (242-A)	N/A		
DA.12.2	TANK ANNULUS VENTILATION SYSTEM	H-2-38214	1	
DA.12.2.1	Annulus Diff. Pressure Subsystem	H-2-38217	0	3.2.1.2.3.1
DA.13	TRANSFER LINE CONTROL SYSTEM			1. 3.2.1.1.2.5 2. 3.2.1.1.2.8
DA.13.1	PUMP CONTROL SUBSYSTEM	H-2-38209	0	1. 3.2.1.1.2.9
DA.13.2	VALVE POSITION INSTRUMENTATION/ INDICATION (No electrical Sys.)	H-2-38217	0	1. 3.2.1.1.2.10
DA.13.3	VALVE CONTROL SYSTEM (No automation)	H-2-38217	0	1. 3.2.1.1.2.10
DA.13.4	PRESSURE SWITCH (Flow Indication) INSTRUMENTATION (Flush Pt)	H-2-38217 (FLUSH PT ONLY)	0	1. 3.2.1.1.2.9
DA.13.5	WASTE FLOW MONITORING INSTRUMENTATION (Service Pt)	H-2-38217	0	1. 3.2.1.1.2.11
DA.14	TANK CONTENTS MONITORING SYSTEM			1. 3.2.1.1.2.6

EXISTING TANK FARM EQUIPMENT SYSTEM DRAWING REFERENCES INSTRUMENTS & CONTROL SYSTEMS				
REF NO.	SYSTEM NAME	DRAWING REFERENCES	NO. OF ECNs OUTSTANDING	PDRD REFERENCE
DA.11	LEAK CONTROL SYSTEM	H-2-38217, H-2-38211	0	1. 3.2.1.1.2.4
DA.14.1	TEMPERATURE INSTRUMENTATION Thermocouple Probe	H-2-38217	0	1. 3.2.1.1.1.9 2. 3.2.1.1.1.25 3. 3.2.1.2.1.1.1
DA.14.3	CHEMICAL COMPOSITION INSTRUMENTATION			1. 3.2.1.1.1.1 2. 3.2.1.1.1.2.1.1 3. 3.2.1.1.1.2.1.2
DA.14.3.1	TK-244-A Weight Factor & Specific Gravity Instrumentation	H-2-38217, 38218	1	1. 3.2.1.1.1.2.1.2
DA.14.3.1	Sample Tubes	H-2-38217, 38218	1	
DA.14.3.2	Weight Factor & Specific Gravity Pressure Sensors	H-2-38217, 38218	1	
DA.14.3.3	Weight Factor Cabinet	H-2-38217, 38218	1	
DA.14.3.5	W.F. & SpG Press. SW & Indicators	H-2-38217, 38218	1	
DA.14.4	TANK LIQUID SURFACE LEVEL INSTRUMENTATION	H-2-38217	0	1. 3.2.1.1.1.5 2. 3.2.1.1.1.13 3. 3.2.1.1.2.1.2
DA.16	SCC STATUS/MONITORING SYSTEM			1. 3.2.1.1.2.1 2. 3.2.1.1.2.3
DA.16.1	AC POWER SUPPLY STATUS INST.	H-2-38208	1	
DA.16.2	AIR SUPPLY STATUS INST.	H-2-38217	0	
DA.16.3	WATER SUPPLY STATUS INST.	H-2-38217	0	

9.5 Special Testing

This section is not applicable.

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9.6 Field Assessment Questionnaire

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EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS				
REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS		FINDINGS/COMMENTS
		DESCRIPTION		
DA.11	LEAK CONTROL SYSTEM			
DA.11.2	ANNULUS LEAK INSTRUMENTATION			
DA.11.2.1	CAM Radiation Monitoring Subsystem			
DA.11.2.1.1	Air Sampler Probe/ Tubing/ etc	<ol style="list-style-type: none">1. Inspect instrument tubing where accessible.2. Estimate maintenance repair frequency for equipment.3. Determine method of calibration and determine if equipment can be calibrated.4. Determine known continuous problems (operating or maintenance) with the equipment.5. Take photographs of equipment to illustrate problem areas.	Taken out of service per instrument PIC.	
DA.11.2.1.2	Radiation Analyzer	<ol style="list-style-type: none">1. Inspect instrument cables where accessible.2. Inspect wiring & terminal boxes for NEC compliance, where accessible.3. Inspect instrument tubing where accessible.4. Inspect equipment and cabinets/terminal boxes for corrosion.5. Estimate age of equipment.6. Estimate maintenance repair frequency for equipment.7. Determine method of calibration and determine if equipment can be calibrated.8. Determine known continuous problems (operating or maintenance) with the equipment.9. Take photographs of equipment to illustrate problem areas.	<ol style="list-style-type: none">1) Cables are in adequate condition.2) Wiring and terminal blocks exhibited poor workmanship and poor labeling (photo).3)N/A4) No corrosion was noted although there is dirt and moisture inside the cabinet. The RIAS-A victoreen radiation monitor is missing the outer dust cover.(photo)5) Age 15 + years6) Repair frequency is unavailable. Taken out of service.7) Method of calibration is unavailable. Taken out of service.8) Equipment was taken out of service per I&C PIC. Reasons for removing from service are equipment is outdated, alarms continuously due to high back ground readings.9) Photos taken.	
DA.11.2.1.3	Cabinet	<ol style="list-style-type: none">1. Inspect equipment and cabinets/terminal boxes for corrosion.2. Estimate maintenance repair frequency for equipment.3. Take photographs of equipment to illustrate problem areas.	<ol style="list-style-type: none">1) The enclosure door seal and latches are missing or in poor condition. The door is held in the closed position with an ink pen cap.2) No maintenance or repair history is available for equipment enclosures.3) Photos taken.	
DA.11.2.1.4	3-Pen recorder & Alarms (242-A?)	<ol style="list-style-type: none">1. Inspect instrument cables where accessible.2. Inspect equipment and cabinets/terminal boxes for corrosion.3. Estimate age of equipment.4. Estimate maintenance repair frequency for equipment.5. Determine method of calibration and determine if equipment can be calibrated.6. Determine known continuous problems (operating or maintenance) with the equipment.7. Take photographs of equipment to illustrate problem areas.	Recorders are no longer in service. Data sent to 242A MCS computer system.	
DA.11.2.1.5	Signal Wiring/ Conduit	<ol style="list-style-type: none">1. Inspect wiring & terminal boxes where accessible for NEC compliance.	<ol style="list-style-type: none">1) Wireway extending from the I&C building to the vent pit is corroded and needs to be repainted (photo). Per interview wiring is in adequate condition.	

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS				
REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS		FINDINGS/COMMENTS
		DESCRIPTION		
DA.II.2.2	Weight Factor & Specific Gravity Monitoring System			
DA.II.2.2.1	Sample Tubes	1. Inspect instrument tubing where accessible.		Per interview there is a small leak in the line but system can still be calibrated to tolerances.
DA.II.2.2.2	Weight Factor & Specific Gravity Pressure Sensors	1. Inspect instrument tubing where accessible. 2. Inspect equipment and cabinets/terminal boxes for corrosion. 3. Estimate age of equipment. 4. Estimate maintenance repair frequency for equipment. 5. Determine method of calibration and determine if equipment can be calibrated. 6. Determine known continuous problems (operating or maintenance) with the equipment. 7. Take photographs of equipment to illustrate problem areas.		The following is per interview: 1) Tubing is in adequate condition. 2) Cabinets are in adequate condition. 3) Estimated age is 15+ years. 4) Repair frequency is undetermined. 5) No calibration. 6) Tubing plug frequently, requiring system to be manually flushed. 7) Photos not available.
DA.II.2.2.3	Weight Factor Cabinet			No cabinet in the farm proper. Transmitters are rack mounted in the I&C building within the farm. (photo taken)
DA.II.2.2.4	reserved			
DA.II.2.2.5	W.F. & SpG Press. Switches & Indicators	1. Inspect wiring & terminal boxes for NEC compliance, where accessible. 2. Inspect instrument tubing where accessible. 3. Estimate maintenance repair frequency for equipment. 4. Determine method of calibration and determine if equipment can be calibrated. 5. Take photographs of equipment to illustrate problem areas.		1) Wiring/tbx's are in adequate condition. 2) Instrument tubing is in adequate condition. 3) Low repair frequency 4) Calibrated annually 5) Xmitters are in good condition. Foxboro model E13DL and 823DP-13N1NL2-M.
DA.II.3	PIPELINE LEAK INSTRUMENTATION			
DA.II.3.3	Encasement Instruments; Seal Pots (Liquid Presence Sensors)	1. Inspect wiring & terminal boxes, where accessible, for NEC compliance. 2. Inspect equipment and cabinets/terminal boxes for corrosion. 3. Estimate age of equipment. 4. Estimate maintenance repair frequency for equipment. 5. Determine method of calibration and determine if equipment can be calibrated. 6. Determine known continuous problems (operating or maintenance) with the equipment. 7. Take photographs of equipment to illustrate problem areas.		The following is per interview: 1) Wiring/tbx's are in adequate condition. 2) Equipment is in adequate condition. 3) 15+ years. 4) Low repair frequency. 5) Calibrated annually. 6) No known maintenance problems. 7) No photos taken.

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS				
REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS		FINDINGS/COMMENTS
		DESCRIPTION		
DA.II.3.4	Signal Wiring/ Conduit/ Terminal Boxes	1. Inspect wiring & terminal boxes for NEC compliance. 2. Inspect equipment and cabinets/terminal boxes for corrosion. 3. Estimate age of equipment. 4. Determine known continuous problems (operating or maintenance) with the equipment. 5. Take photographs of equipment to illustrate problem areas.		The following is per interview: 1) Wiring/tbx's are in adequate condition. 2) Equipment is in adequate condition. 3) 15 + years. 4) No known maintenance problems. 5) No photos taken.
DA.II.3.5	Pump Pit Instruments (LDE only)	Same as DA.II.3.3 description.		1) External LDE tbx only was inspected and the use of SO cord to the leak detection probe is utilized (common with all farms inspected). 2) Interior of enclosure could not be accessed. Unable to determine if there is an adequate seal where the alarm light is mounted. Exterior surface is in good condition. 3) 15 + years. 4) Information not available at this time. 5) Calibrated annually 6) Information not available at this time. 7) Photo taken of exterior surface only.
DA.II.4	PUMP PERMISSIVE INSTRUMENTATION (Master Pump shutdown)			
DA.II.4.1	Master Pump Shutdown Relay Panel (242-A)			Not assessed.
DA.II.4.2	MPS Pushbutton Control Panel (242-A)			Not assessed.
DA.II.4.3	Signal Wiring/Conduit/TBX			Not assessed.
DA.II.5	LOCAL ALARM ANNUNCIATION & ALARM PANELS			
DA.II.5.1	244-A Alarm Panel	1. Inspect wiring & terminal boxes for NEC compliance, where accessible. 2. Inspect instrument tubing where accessible. 3. Estimate age of equipment. 4. Estimate maintenance repair frequency for equipment. 5. Take photographs of equipment to illustrate problem areas.		No local alarm panel.
DA.II.5.2	(242-A Alarms)			Not assessed.
DA.12	VENTILATION CONTROL SYSTEM			

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS				
REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS		FINDINGS/COMMENTS
		DESCRIPTION		
DA.12.1	TANK PRIMARY VENTILATION SYSTEM			
DA.12.1.1	Tank Diff. Pressure Instr. Subsystem (part of WF-SpG system)	See description under DA.14.3.1.		
DA.12.1.1.1	Tank Riser Tubing to Pressure Sensor/Transmitter	See description under DA.14.3.1.		
DA.12.1.1.2	Pressure Sensor/Transmitter	See description under DA.14.3.1.		
DA.12.1.1.4	Pressure Switch/Alarm	See description under DA.14.3.1.		
DA.12.1.1.5	Pressure Recorder (242-A)	See description under DA.14.3.1.		
DA.12.1.2	HEPA Filter Diff. Pressure Instr.	1. Inspect equipment and cabinets/terminal boxes for corrosion. 2. Estimate age of equipment. 3. Estimate maintenance repair frequency for equipment. 4. Determine method of calibration and determine if equipment can be calibrated. 5. Take photographs of equipment to illustrate problem areas.		1) Cabinets and tbs's are in adequate condition. 2) 15+ years 3) Low repair frequency 4) Calibrated annually 5) No photos taken.
DA.12.1.3	Temperature Instrumentation	1. Inspect wiring & terminal boxes, where accessible, for NEC compliance. 2. Inspect equipment and cabinets/terminal boxes for corrosion. 3. Estimate age of equipment. 4. Estimate maintenance repair frequency for equipment. 5. Determine method of calibration and determine if equipment can be calibrated. 6. Take photographs of equipment to illustrate problem areas.		1) Wiring and tbs's are in adequate condition. 2) TIC-1-1 is out of service. TIC-2-1 is in adequate condition. Sensor probes are inadequately supported at both locations. 3) 15+ years. 4) Repair history unavailable. Out of service for an extended period of time. 5) Calibrated annually when it was operational. 6) Photos taken.
DA.12.1.4	Heater Control Subsystem	1. Inspect wiring & terminal boxes, where accessible, for NEC compliance. 2. Inspect equipment and cabinets/terminal boxes for corrosion. 3. Estimate age of equipment. 4. Estimate maintenance repair frequency for equipment. 5. Take photographs of equipment to illustrate problem areas.		1) Wiring is in adequate condition. 2) Enclosure adjacent to TIC-1-1 is moderately corroded. 3) 15+ years. 4) TIC-1-1 is out of service. TIC-2-1 is operational and in adequate condition. 5) Photos taken.

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS			
REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS	FINDINGS/COMMENTS
		DESCRIPTION	
DA.12.1.5	Fan-Motor Control Subsystem	<ol style="list-style-type: none"> 1. Inspect wiring & terminal boxes, where accessible, for NEC compliance. 2. Inspect equipment and cabinets/terminal boxes for corrosion. 3. Estimate age of equipment. 4. Estimate maintenance repair frequency for equipment. 5. Take photographs of equipment to illustrate problem areas. 	Not assessed.
DA.12.1.6	Damper Control Subsystem	<ol style="list-style-type: none"> 1. Inspect equipment and cabinets/terminal boxes for corrosion. 2. Estimate age of equipment. 3. Estimate maintenance repair frequency for equipment. 4. Take photographs of equipment to illustrate problem areas. 	Not assessed.
DA.12.1.9	Regulated Stack Monitoring System (296-A-257)		
DA.12.1.9.1	<i>Probe in Stack & Tubing from Stack to CAM</i>	<ol style="list-style-type: none"> 1. Inspect instrument tubing where accessible. 2. Inspect equipment and cabinets/terminal boxes for corrosion. 3. Estimate maintenance repair frequency for equipment. 4. Determine method of calibration and determine if equipment can be calibrated. 5. Take photographs of equipment to illustrate problem areas. 	<p>The following is per interview:</p> <ol style="list-style-type: none"> 1) Tubing is in good condition. 2) Cabinet exhibited dirt and moisture infiltration. Vent louver has no filter medium which allows dirt and moisture to enter the cabinet. 3) Undetermined. 4) N/A 5) Photo taken.
DA.12.1.9.2	CAMs	<ol style="list-style-type: none"> 1. Inspect instrument cables where accessible. 2. Inspect wiring & terminal boxes for NEC compliance, where accessible. 3. Inspect instrument tubing where accessible. 4. Inspect equipment and cabinets/terminal boxes for corrosion. 5. Estimate age of equipment. 6. Estimate maintenance repair frequency for equipment. 7. Determine method of calibration and determine if equipment can be calibrated. 8. Determine known continuous problems (operating or maintenance) with the equipment. 9. Take photographs of equipment to illustrate problem areas. 	<p>The following is per interview:</p> <ol style="list-style-type: none"> 1) Cables are in adequate condition. 2) Wide use of SO cords throughout the cabinet. 3) Tubing is in adequate condition. 4) No corrosion was noted. 5) 15+ years. 6) Low repair frequency. 7) Undetermined. 8) CAMs are being replaced with the new modular units (split CAM) in the near future. 9) Photo taken.
DA.12.1.9.3	CAM Cabinet	<ol style="list-style-type: none"> 1. Inspect equipment and cabinets/terminal boxes for corrosion. 2. Estimate maintenance repair frequency for equipment. 3. Take photographs of equipment to illustrate problem areas. 	<ol style="list-style-type: none"> 1) Cabinet exhibited dirt and moisture infiltration. Vent louver has no filter medium which allows dirt and moisture to enter the cabinet. 2) N/A 3) Photo taken.

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS			
REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS	
		DESCRIPTION	
DA.12.1.9.4	Vacuum Pumps	<ol style="list-style-type: none"> 1. Inspect wiring & terminal boxes for NEC compliance where accessible. 2. Inspect instrument tubing where accessible. 3. Inspect equipment and cabinets/terminal boxes for corrosion. 4. Estimate age of equipment. 5. Estimate maintenance repair frequency for equipment. 6. Determine known continuous problems (operating or maintenance) with the equipment. 7. Take photographs of equipment to illustrate problem areas. 	<ol style="list-style-type: none"> 1) Use of SO cords throughout the cabinet. 2) Vacuum tubing is in adequate condition. 3) Dirt noted inside cabinet. 4) Unknown. 5) Vacuum pump not assessed. 6) Vacuum pump not assessed. 7) Photo taken.
DA.12.1.9.5	?-pen Recorder (242-A?)	<ol style="list-style-type: none"> 1. Inspect instrument cables where accessible. 2. Inspect wiring & terminal boxes for NEC compliance where accessible. 3. Inspect instrument tubing where accessible. 4. Inspect equipment and cabinets/terminal boxes for corrosion. 5. Estimate age of equipment. 6. Estimate maintenance repair frequency for equipment. 7. Determine method of calibration and determine if equipment can be calibrated. 8. Determine known continuous problems (operating or maintenance) with the equipment. 9. Take photographs of equipment to illustrate problem areas. 	The following is per interview: Pen recorders have been taken out of service. The data is now supplied to the evaporator MCS computer.
DA.12.2	TANK ANNULUS VENTILATION SYSTEM		
DA.12.2.1	Annulus Diff. Pressure Subsystem	<ol style="list-style-type: none"> 1. Inspect instrument tubing where accessible. 2. Inspect equipment and cabinets/terminal boxes for corrosion. 3. Estimate age of equipment. 4. Estimate maintenance repair frequency for equipment. 5. Determine method of calibration and determine if equipment can be calibrated. 6. Take photographs of equipment to illustrate problem areas. 	<ol style="list-style-type: none"> 1) Tubing is in adequate condition. 2) Tbx's and cabinets are in adequate condition. 3) 15+ years. 4) Low repair rate. 5) Undetermined. 6) No photo taken.
DA.13	TRANSFER LINE CONTROL SYSTEM		
DA.13.1	PUMP CONTROL SUBSYSTEM	<ol style="list-style-type: none"> 1. Inspect instrument cables where accessible. 2. Inspect wiring & terminal boxes for NEC compliance, where accessible. 3. Inspect equipment and cabinets/terminal boxes for corrosion. 4. Estimate age of equipment. 5. Estimate maintenance repair frequency for equipment. 6. Determine known continuous problems (operating or maintenance) with the equipment. 7. Take photographs of equipment to illustrate problem areas. 	Not assessed.

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS				
REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS		FINDINGS/COMMENTS
		DESCRIPTION		
DA.13.2	VALVE POSITION INSTRUMENTATION/ INDICATION (No electrical Sys.)	Verify that it is not electrical.		Manual valve positioning.
DA.13.3	VALVE CONTROL SYSTEM (No automation)	Verify that it is not electrical.		Manual valve positioning.
DA.13.4	PRESSURE SWITCH (Flow Indication) INSTRUMENTATION (Flush Pit)	1. Inspect wiring & terminal boxes for NEC compliance, where accessible. 2. Inspect equipment and cabinets/terminal boxes for corrosion. 3. Estimate maintenance repair frequency for equipment. 4. Determine method of calibration and determine if equipment can be calibrated. 5. Take photographs of equipment to illustrate problem areas.		No longer in service per interview.
DA.13.5	WASTE FLOW MONITORING INSTRUMENTATION (Service Pit)	1. Inspect instrument cables where accessible. 2. Inspect wiring & terminal boxes for NEC compliance, where accessible. 3. Inspect equipment and cabinets/terminal boxes for corrosion. 4. Estimate age of equipment. 4. Estimate maintenance repair frequency for equipment. 5. Determine method of calibration and determine if equipment can be calibrated. 6. Determine known continuous problems (operating or maintenance) with the equipment. 7. Take photographs of equipment to illustrate problem areas.		The following is per interview: RIAS-SP is out of service and has been for an extended time period. Water is now blanked off.
DA.14	TANK CONTENTS MONITORING SYSTEM			
DA.14.1	TEMPERATURE INSTRUMENTATION Thermocouple Probe	1. Inspect instrument cables where accessible. 2. Inspect wiring & terminal boxes for NEC compliance, where accessible. 3. Inspect equipment and cabinets/terminal boxes for corrosion. 4. Estimate age of equipment. 5. Estimate maintenance repair frequency for equipment. 6. Determine method of calibration and determine if equipment can be calibrated. 7. Take photographs of equipment to illustrate problem areas.		The following is per interview: Tank probe is out of service and has been for an extend period of time.
DA.14.3	CHEMICAL COMPOSITION INSTRUMENTATION			

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS			
REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS	FINDINGS/COMMENTS
		DESCRIPTION	
DA 14.3.1	TK-244-A Weight Factor & Specific Gravity Instrumentation		
DA 14.3.1.1	<i>Sample Tubes</i>	<ol style="list-style-type: none"> 1. Inspect instrument tubing where accessible. 2. Inspect equipment and cabinets/terminal boxes for corrosion. 3. Estimate maintenance repair frequency for equipment. 4. Take photographs of equipment to illustrate problem areas. 	<p>The following is per interview:</p> <ol style="list-style-type: none"> 1) Tubing is in adequate condition. Frequently requires flushing due to sample tubes becoming plugged. 2) Equipment and cabinets are in adequate condition. 3) Low repair frequency. 4) No photo taken.
DA 14.3.1.2	<i>Weight Factor & Specific Gravity Pressure Sensors</i>	<ol style="list-style-type: none"> 1. Inspect instrument tubing where accessible. 2. Inspect equipment and cabinets/terminal boxes for corrosion. 3. Estimate age of equipment. 4. Estimate maintenance repair frequency for equipment. 5. Determine method of calibration and determine if equipment can be calibrated. 6. Determine known continuous problems (operating or maintenance) with the equipment. 7. Take photographs of equipment to illustrate problem areas. 	<p>The following is per interview:</p> <ol style="list-style-type: none"> 1) See comment at 4.3.1 item 1. 2) Not assessed. 3) 15+ years. 4) See comment at 4.3.1 item 1. 5) N/A 6) See comment at 4.3.1 item 1. 7) No photo taken.
DA 14.3.1.3	<i>Weight Factor Cabinet</i>	<ol style="list-style-type: none"> 1. Inspect instrument cables where accessible. 2. Inspect wiring & terminal boxes for NEC compliance, where accessible. 3. Inspect instrument tubing where accessible. 4. Inspect equipment and cabinets/terminal boxes for corrosion. 5. Estimate age of equipment. 6. Estimate maintenance repair frequency for equipment. 7. Determine method of calibration and determine if equipment can be calibrated. 8. Determine known continuous problems (operating or maintenance) with the equipment. 9. Take photographs of equipment to illustrate problem areas. 	<p>The following is per interview and field inspection:</p> <ol style="list-style-type: none"> 1) Cables are in good condition. 2) Wiring and boxes are in good condition. 3) Tubing is in good condition. 4) Xmitters are rack mounted inside I&C building and are in good condition. 5) Unknown. 6) Low repair frequency. 7) Unknown. 8) No known continuous problems. 9) Photo taken.
DA 14.3.1.5	<i>W.F. & SpG Press. SW & Indicators</i>	<ol style="list-style-type: none"> 1. Inspect wiring & terminal boxes for NEC compliance, where accessible. 2. Inspect instrument tubing where accessible. 3. Inspect equipment and cabinets/terminal boxes for corrosion. 4. Estimate maintenance repair frequency for equipment. 5. Determine method of calibration and determine if equipment can be calibrated. 6. Determine known continuous problems (operating or maintenance) with the equipment. 7. Take photographs of equipment to illustrate problem areas. 	<p>The following is per interview:</p> <p>No local readout. Signal is fed to 242A MCS computer system.</p>

EXISTING TANK FARM EQUIPMENT FIELD ASSESSMENT TABLE INSTRUMENTS & CONTROL SYSTEMS			
REF. NO	SYSTEM NAME	FIELD ASSESSMENT REQUIREMENTS	FINDINGS/COMMENTS
		DESCRIPTION	
DA.I4.4	TANK LIQUID SURFACE LEVEL INSTRUMENTATION	See description under DA.I4.3.1.1 through DA.I4.3.1.5. 1. Inspect the panel indicators.	The following is per interview: No local readout. Signal is fed to 242A MCS computer system.
DA.I6	SCC STATUS/MONITORING SYSTEM	1. Determine what indication exists, if any.	No indication exists per interview.
DA.I6.1	AC POWER SUPPLY STATUS INST.	1. Determine what indication exists, if any.	Not assessed.
DA.I6.2	AIR SUPPLY STATUS INST.	1. Determine what indication exists, if any.	No air quality instrumentation exists.
DA.I6.3	WATER SUPPLY STATUS INST.	1. Determine what indication exists, if any.	No water monitoring instrumentation exists.
DA.I6.5	HEAT TRACE SYSTEM STATUS INST.	1. The drawings do not indicate that this system exists. Review the panel instrumentation and verify this.	N/A
DA.I6.6	CATHODIC PROTECTION SYSTEM STATUS INST.	1. The drawings do not indicate that this system exists. Review the panel instrumentation and verify this.	N/A
DA.I7	HEAT TRACE CONTROL SYSTEM	1. The drawings do not indicate that this system exists. Review the panel instrumentation and verify this.	N/A
DA.I8	CATHODIC PROTECTION CONTROL SYSTEM	1. The drawings do not indicate that this system exists. Review the panel instrumentation and verify this.	Cathodic protection specifically for 244A proper does not exist. Cathodic protection is exterior of the farm for transfer lines.

* Interviews conducted were with east tankfarm maintenance department I&C PIC.

This individual has in excess of 20 years experience at Hanford as a instrument tech and as a PIC in the instrument maintenance department.

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9.7 CAIS Data Sheets

244A DCRT INSTRUMENT SYSTEMS NARRATIVE

INSPECTION METHODS AND REPORT FORMAT

The inspection data was collected by a combination of field visual inspection and an interview with the east Tank Farm Maintenance I & C PIC, who has in excess of twenty years experience at Hanford in the instrumentation field. The inspection included instruments located in 244A farm proper, which also includes the instrument building located within the farm. Instruments and associated equipment located within 242A evaporator complex were not included in the field assessment.

EQUIPMENT DESCRIPTION

Instrumentation for the leak control system includes the radiation analyzer for the annulus, weight factor and specific gravity systems, transfer pipeline liquid presence sensors and pump pit leak detectors. There is no local alarm annunciator panel for 244A.

Ventilation system instrumentation includes: tank pressure sensors, HEPA filter differential pressure alarms, heater controls, motor control system, damper control, and the stack monitoring system.

Transfer line instrumentation includes: the pump control system, flow indication (pressure switches), and the waste flow monitoring (RIAS-SP).

Tank contents monitoring include the temperature thermocouple.

Chemical composition instrumentation includes the weight factor and specific gravity sensors (which are also utilized to measure tank contents).

No monitoring occurs for the following systems: air supply, water supply, cathodic protection, or the heat trace system.

SYSTEMS CONDITION SUMMARY

The annulus leak control radiation monitor (RIAS-A) has been taken out of service due to continuous alarm because of high background readings. Lead shielding was added to the back of the cabinet but did not yield the desired results. The cabinet door latches are missing (currently being held closed by an ink pen cap) and the

door seal is in poor condition. This condition allows dirt and moisture to penetrate the cabinet and the electronic components (the metal dust cover for the RIAS-A has been removed). The three pen recorders have been removed (located at 242A evaporator). A 4" X 4" X 25' raceway extending from the I & C building into the farm is moderately corroded and needs repainting.

The interview with the I & C PIC revealed that the weight factor and specific gravity sample tubing has a small leak which has not affected calibration. The dip tubes plug often, which requires manual flushing by maintenance to correct the problem. The weight factor and specific gravity transmitters are manufactured by Foxboro and have the pressure to current conversion incorporated in their function. A visual inspection and interview did not reveal any deficiencies associated with the transmitters. No local alarm annunciator panel is provided at 244A proper. All monitoring is done at the 242A evaporator complex.

The temperature controller (TIC-1-1) for the annulus intake station is out of service and has been for some time. Sensor probes for both TIC-1-1 and TIC-2-1 are poorly routed and supported. The stack monitoring cabinet is inadequately sealed, allowing dirt and moisture infiltration. No filter element is in place at the cabinet vent louver, and it does not appear there ever was one in place. The CAM is being replaced with a modular unit in the near future per interview with the PIC.

Valve position is manually set throughout the farm with the exception of MOV-2 which is the transfer line from 241-153ER and MOV-1 which is in the ventilation system to isolate the annulus from the tank in the event the exhaust fan should fail. These valves were not assessed at this time. Service pit monitor RIAS-SP victoreen meter cover and dust cover are removed and is currently out of service. Wiring, cables, and terminal blocks with the cabinet housing this instrument are poorly labeled and routed.

The tank thermocouple probe has failed and is currently out of service.

The overall rating of 244A instrumentation is rated as "poor" 3.

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CONDITION ASSESSMENT INFORMATION SYSTEM

CAIS Special Report - RPT-005

Site Component Survey Component Survey Comment	Name	Sys No.	System Name
--	------	---------	-------------

244A-0000 : WASTE VAULT & INSTRUMENT HOUSE

244A 296-A-25 Stack Monitoring System

244A 296-A-25 CABNT Reg Stack CAM Cabinet 2.1.9.3 CAM Cabinet
Vent louver has no filter which allows dirt and moisture to enter the cabinet.

244A 296A RM EXH Reg. Stack CAM 2.1.9.2 CAMs
Per Interview with I&C PIC; Cables are adequate cond. Wide use of SO cords throughout the cabinet. CAMs are being replaced with the new modular units.

244A EXH R Reg. Stack Monitor Exh Record 2.1.9.5 ?-pen Recorder (242-A?)
Per interview with I&C PIC; The recorder has been taken out of service. The data is now supplied to the evaporator MCS computer.

244A FE-EXH-1 Stack Monitoring Probe&Tubing 2.1.9.1 Probe in Stack & Tubing from Stack to C
Per interview with I&C PIC, tubing is in good condition. Cabinet exhibited dirt

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and moisture infiltration. Vent louver has no filter medium, dirt allowed into cabinet.

244A FE-EXH-2 Stack Monitoring Probe&Tubing 2.1.9.1 Probe in Stack & Tubing from Stack to C
Per interview with I&C PIC, tubing is in good condition. Cabinet exhibited dirt and moisture infiltration. Vent louver has no filter medium, dirt allowed into cabinet.

244A FE-EXH-3 Stack Monitoring Probe&Tubing 2.1.9.1 Probe in Stack & Tubing from Stack to C
Per interview with I&C PIC, tubing is in good condition. Cabinet exhibited dirt and moisture infiltration. Vent louver has no filter medium, dirt allowed into cabinet.

244A P-EXH-1 Reg Stack Cam Vacuum Pump 2.1.9.4 Vacuum Pumps
SO Cord throughout cabinet, tubing adequate cond., vacuum pumps not assessed.

244A P-EXH-2 Reg Stack Cam Vacuum Pump 2.1.9.4 Vacuum Pumps
SO Cord throughout cabinet, tubing adequate cond., vacuum pumps not assessed.

Site Component	Name	Sys No.	System Name
Survey Component			
Survey Comment			

244A-0000 : WASTE VAULT & INSTRUMENT HOUSE

244A ANN EXH TANK ANNULUS VENTILATION SYS

244A ANN SGT ANNULUS SPECIFIC GRAVITY TRANS 2.1.1 Tank Diff. Pressure Inst. Subsystem (pa
Per interview with I&C PIC; Tubing is in
adequate condition. TBX and vabinet are
in adequate condition. Low repair rate

244A ANN WFT ANNULUS WEIGHT FACTOR TRANS. 2.1.1 Tank Diff. Pressure Inst. Subsystem (pa
Per interview with I&C PIC; Tubing is in
adequate condition. TBX and vabinet are
in adequate condition. Low repair rate

244A PP Inst 244A Pump Pit Leak Inst.

244A PP LDE Pump Pit Leak Detection Elemen 1.3.5 Pump Pit Instruemnts (LDE only)
External LDE tbx only was inspected - th
e use of SO cord to the leak detection p
robe is used (common with all farms insp

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) Interior of enclosure - not inspected
, no access.

244A PP SP Pres Pump Pit Seal Pot Pres Sensor 1.3.3 Encasement Instruments; Seal Pots (Liqu
Per interview with I&C PIC the wiring/tb
x are in adequate cond., Calibrated annua
lly, no known maint. problems.

244A PP Wire/Cond Pump Pit Leak Inst Wire/Cond 1.3.4 Signal Wiring/ Conduit/ Terminal Boxes
Per interview with I&C PIC, Wiring/TBX a
re in adequate cond. eqp is in adequate
cond., no known maint. problems.

244A RIAS-A ANNULUS RADIATION ANALYZER

244A RIAS - R/A ANNULUS RAD 3-PEN RECORD/ALARM 1.2.1.4 3-Pen recorder & Alarms (242-A?)
Recorders no longer in service; data cou
ld be sent to 242A MCS if rad detectors
were enabled.

244A RIAS WIRE/COND ANNULUS ALARM SIGNAL WIRE/COND 1.2.1.5 Signal Wiring/ Conduit
Wireway extending from the I&C building
to the vent pit is corroded and needs to
be repainted. Per interview wiring is
in adequate condition.

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CONDITION ASSESSMENT INFORMATION SYSTEM

CAIS Special Report - RPT-005

Site Component Survey Component Survey Comment	Name	Sys No.	System Name
--	------	---------	-------------

244A-0000 : WASTE VAULT & INSTRUMENT HOUSE

244A RIAS-A CABINET	Radiation Alarm Cabinet	1.2.1.3	Cabinet
244A RIAS-A METER Equip taken OOS per I&C PIC because it is outdated & continuously alarms due to high background.	RADIATION ALARM METER	1.2.1.2	Radiation Analyzer
244A RIAS-CABINET Enclosure door seal & latches missing/poor shape. Door wedged shut w/ ink pen cap. No maint history available. Photos taken.	Radiation Alarm Cabinet	1.2.1.3	Cabinet

244A TK CHC COMP TANK CHEMICAL COMPOSITION INST

244A PT TK SW Tank WF & SpG pressure SW 4.3.5 W.F. & SpG Press. SW & Indicators
No local readout, signal is fed to 242A MCS computer system.

244A SGT-TK Specific Gravity Transmitter 4.3.2 Weight Factor & Specific Gravity Pressure

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Not assessed

244A SGT-TK CAB	SPECIFIC GRAVITY INST. CAB	4.3.3	Weight Factor Cabinet
per interview and field inspection; les are in good condition. Wiring and TB S's are in good condition. X mitters are rack mounted insided I&C building, in g ood conditon. No known problems.			
244A SMP TUBES	SAMPLE TUBES	4.3.1	TK-244-A Weight Factor & Specific Gravi
Per interview with I&C PIC;Tubing is in adequate condition. Frequently requires flushing due to sample tubes becoming p lugged. Equipment and cabinets are in a dequate condition.			
244A WFT-TK	Weight Factor Transmitter	4.3.2	Weight Factor & Specific Gravity Pressu
Not assessed			
244A TK Cont Monit.	Tank Monitoring SYS		
244A TE-TK	Tank Temp Element	4.1	TEMPERATURE INSTRUMENTATION Thermocoupl

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CONDITION ASSESSMENT INFORMATION SYSTEM

CAIS Special Report - RPT-005

Site Component	Name	Sys No.	System Name
Survey Component			
Survey Comment			

244A-0000 : WASTE VAULT & INSTRUMENT HOUSE

Per interview with I&C PIC; The tank temperature element is out of service, and has been for extended period of time.

244A TK WF-SPG Tk weight factor & sp. gravity

244A TK WF/SPG TUBE WF/SPG TUBING 1.2.2.1 Sample Tubes
Per interview with I&C PIC there is a small leak in the line but the system can still be calibrated to tolerance.

244A WF&SPG SE WF&SPG PRESSURE SENSOR 1.2.2.2 Weight Factor & Specific Gravity Pressure
Per interview with I&C PIC the tubing plugs frequently, requiring system to be manually flushed.

244A WF&SPG CABINET CABINET FOR WEIGHT FACTOR SYS 1.2.2.3 Weight Factor Cabinet
No cabinet exists, instrument mounted in I&C building

244A WF&SPG PS/I WF&SPG Pres. Switch & Indicator 1.2.2.5 W.F. & SpG Press. Switches & Indicators

WHC-SD-W314-ES-018, Rev 0

244A Tk EXH

Tank Primary Ventilation SYS

244A TK EXH HEAP DP TK Primary HEPA Diff Pres Inst 2.1.2 HEPA Filter Diff. Pressure Instr.

244A TK TIC-1-1

TK Heater Controller

2.1.4 Heater Control Subsystem

Wiring is adequate condition. Enclosure adjacent to TIC-1-1 is moderately corroded. TIC-1-1 is out of service. TIC-2-1 is operational and in adequate condition.

244A TK TIC-1-2

TK Heater Controller

2.1.4 Heater Control Subsystem

Wiring is adequate condition. Enclosure adjacent to TIC-1-1 is moderately corroded. TIC-1-1 is out of service. TIC-2-1 is operational and in adequate condition.

244A Tk EXH TE

Primary EXH Temperature Inst 2.1.3 Temperature Instrumentation

Per interview with I&C PIC, Wiring and TBX are in adequate cond. TIC-1-1 is out of service. TIC-2-1 is in adequate condition. Sensor probes are inadequately supported at both locations.

13-NOV-95

CONDITION ASSESSMENT INFORMATION SYSTEM

Page 5 of 5

CAIS Special Report - RPT-005

Site Component Survey Component Survey Comment	Name	Sys No.	System Name
--	------	---------	-------------

244A-0000 : WASTE VAULT & INSTRUMENT HOUSE

244A Trans Line Transfer Line Control SYS

244A FP PAS No longer in service.	Flush Pit Pressure Switch	3.4	PRESSURE SWITCH (Flow Indication) INSTR
--------------------------------------	---------------------------	-----	---

244A RIAS-SP Per interview with I&C PIC; RIAS-SP is out of service and has been extended time period. Water is now blanked off.	Radiation Alarm Service Pit	3.5	WASTE FLOW MONITORING INSTRUMENTATION (
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9.8 Other Reports

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9.9 CAMP Work Sheets

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WHC-SD-W314-ES-018, Rev 0

CAMP RATING FORM

Project Title: 244-A DCRT Annulus Leak Instrumentation/ CAM Rad. monitoring System

B&R Code: _____ **Rev #:** 0 **FY:** 1996

Project Id #: DA.11.2.1 **FUDS:** _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.				
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety	35			
Fire Protection				
Health Physics	40			
Criticality				
Infrastructure				40
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				40
Asset Condition				60
National Business Strategies/Partnerships				
Highest of Each Subcategory	40	20	20	60

PROJECT RATING:	62
Final Project Rating	62

Note: 20 is a Default Rating

Rated By <u>C. D. Acree</u>	Ext	Date Rated <u>9/22/95</u>
------------------------------------	------------	----------------------------------

Reviewed By _____	Ext	Date Reviewed _____
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Applicable Regulations or Policies

H&S, Health Physics, 40: Potential for personnel radiation exposure.
H&S, Industrial Safety, 35: Potential for personnel injury lifting CAM unit (100lbs)
M&I, Asset Condition, 60: Aging system, non-functional, was subject to false alarms.

Additional Information & Affected Projects

M&I, Mission Capability, 35: Aging system, not latest recommend site standard, false alarms, radon interference.
M&I, Infrastructure, 40: Aging System, difficult to maintain.

Shaded Areas Are Not For Use

WHC-SD-W314-ES-018, Rev 0

CAMP RATING FORM

Project Title: 244-A DCRT Annulus Leak Inst./Wt-Ft & SpG Monitoring Subsystem

B&R Code: _____ Rev #: 0 FY: 1996

Project Id #: DA.I1.2.2 FUDS: _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.		40		
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics				
Criticality				
Infrastructure				40
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				50
Asset Condition				50
National Business Strategies/Partnerships				
Highest of Each Subcategory	20	40	20	50

PROJECT RATING: 52

Final Project Rating 52

Note: 20 is a Default Rating

C. D. Acree		9/22/95
Rated By	Ext	Date Rated

Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

M&I, Asset Condition, 50: Equipment is obsolete, maintenance problems, future spare parts problem.
M&I, Mission Capability, 50: Not a good leak detect. Ist., requires water in the annulus.
ER/WM, Compliance, 40: Leak sensitivity not determinate, calibration difficulties, misapplication of leak detection equipment.

Additional Information & Affected Projects

M&I, Infrastructure, 40: Continuous user of instrument air. Water in annulus may interfere with the annulus CAM radiation monitoring system.

Shaded Areas Are Not For Use

WHC-SD-W314-ES-018, Rev 0
CAMP RATINF FORM

Project Title: 244-A DCRT /Pipeline Leak Inst./Encasement Inst.

B&R Code: _____ Rev #: 0 FY: 1996

Project Id #: DA.I1.3.3, (DA.I1.3.5) FUDS: _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.		50		
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety	35			
Fire Protection				
Health Physics	50			
Criticality				
Infrastructure				50
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				50
Asset Condition				55
National Business Strategies/Partnerships				
Highest of Each Subcategory	50	50	20	55

PROJECT RATING:	60
Final Project Rating	60

Note: 20 is a Default Rating

C. D. Acree		9/29/95
Rated By	Ext	Date Rated

Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

H&S, Health Physics, 50: Potential for maintenance personnel radiation exposure.
H&S, Industrial Safety, 35: Potential for personnel radiation exposure.
ER/WM, Compliance, 50: Cannot detect small leaks or detect secondary containment failure.

Additional Information & Affected Projects

M&I, Asset Condition, 55: Aging System, wiring problems, NEC compliance problems.
M&I, Mission Capability, 50: System cannot detect small leaks, cannot detect secondary containment failure, cannot be calibrated, cannot verify system operability.
M&I, Infrastructure, 50: Wiring life expectancy is short.

Shaded Areas Are Not For Use

WHC-SD-W314-ES-018, Rev 0

CAMP RATING FORM

Project Title: 244-A DCRT Pump Permissive (Master Pump Shutdown)

B&R Code: _____ Rev #: 0 FY: 1996

Project Id #: DA.I1.4 FUDS: _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.				
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics				
Criticality				
Infrastructure				45
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				55
Asset Condition				55
National Business Strategies/Partnerships				
Highest of Each Subcategory	20	20	20	55

PROJECT RATING:	55
Final Project Rating	55

Note: 20 is a Default Rating

C. D. Acree		9/29/95
Rated By	Ext	Date Rated
Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

M&I, Mission Capability, 55: Mission adversely impacted by false alarms, any alarm in all tank farms can shut down a transfer, even in farms that are unrelated.

M&I, Asset Condition, 55: Same as Leak Detection System (wiring), re: AN.I1.3.1

M&I, Infrastructure, 45: **Spurious shutdowns cause delays and idle lots of people.**

Additional Information & Affected Projects

M&I, Mission Capability, 55: System provide no operational versatility. Cannot easily make simultaneous transfers. Cannot easily isolate operations in different facilities.

Shaded Areas Are Not For Use

WHC-SD-W314-ES-018, Rev 0

CAMP RATING FORM

Project Title: 244-A DCRT DIFFERENTIAL PRESSURE INSTR. SUBSYSTEM

B&R Code: _____ Rev #: 0 FY: 1996

Project Id #: DA.I2.1.1 (DA.I4.3.1) FUDS: _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.				
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics				
Criticality				
Infrastructure				40
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				50
Asset Condition				40
National Business Strategies/Partnerships				
Highest of Each Subcategory	20	20	20	50

PROJECT RATING:	50
Final Project Rating	50

Note: 20 is a Default Rating

C. D. Acree	9/22/95
Rated By	Date Rated

Reviewed By	Date Reviewed

Applicable Regulations or Policies

M&I, Asset Condition, 40: Aging system, tubing deterioration, spare parts availability concern.
M&I, Capability, 50: Recorders non-functional. Function is not clearly demarked from other systems.
See DA.I4.3.1

Additional Information & Affected Projects

M&I, Infrastructure, 40: Continuous user of instrument air.

Shaded Areas Are Not For Use

WHC-SD-W314-ES-018, Rev 0

CAMP RATING FORM

Project Title: 244-A DCRT/Waste Flow Monitoring Inst./Service Pit Inst.

B&R Code: _____ Rev #: 0 FY: 1996

Project Id #: DA.I3.5.1 FUDS: _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.				
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics				
Criticality				
Infrastructure				
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				55
Asset Condition				55
National Business Strategies/Partnerships				
Highest of Each Subcategory	20	20	20	55

PROJECT RATING:	55
Final Project Rating	55

Note: 20 is a Default Rating

C. D. Acree		9/29/95
Rated By	Ext	Date Rated

Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

M&I, Capability, 55: Radiation Monitoring System in non-functional.
M&I, Asset Condition, 55: Aging System, maintenance problem, non-functional.

Additional Information & Affected Projects

Shaded Areas Are Not For Use

WHC-SD-W314-ES-018, Rev 0

CAMP RATING FORM

Project Title: 244-A DCRT WASTE; TEMPERATURE SENSOR (THERMOCOUPLE)

B&R Code: _____ Rev #: _____ FY: _____

Project Id #: DA.I4.1 FUDS: _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.				
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics	40			
Criticality				
Infrastructure				40
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				50
Asset Condition				50
National Business Strategies/Partnerships				
Highest of Each Subcategory	40	20	20	50

PROJECT RATING: 52

Final Project Rating 52

Note: 20 is a Default Rating

C. D. Acree		9/29/95
Rated By	Ext	Date Rated

Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

M&I, Capability, 50: Only one element, no gradient measurement capability.
M&I, Asset condition, 50: Aging system. Sensor is non-functional.
H&S, Health Physics, 40: Probe maintenance will expose workers to radiation.

Additional Information & Affected Projects

M&I, Infrastructure, 40: Sensor is not maintainable.

Shaded Areas Are Not For Use

WHC-SD-W314-ES-018, Rev 0

CAMP RATING FORM

Project Title: 244-A DCRT WASTE; WEIGHT-FACTOR & SPECIFIC GRAVITY INST. SYSTEM

B&R Code: _____ **Rev #:** _____ **FY:** _____

Project Id #: DA.14.3.1 **FUDS:** _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.				
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics	35			
Criticality				
Infrastructure				40
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				40
Asset Condition				40
National Business Strategies/Partnerships				
Highest of Each Subcategory	35	20	20	40

PROJECT RATING:	42
Final Project Rating	42

Note: 20 is a Default Rating

C. D. Acree	9/29/95
Rated By	Date Rated
Ext	

Reviewed By	Date Reviewed
Ext	

Applicable Regulations or Policies

M&I, Asset Condition, 40: Aging system, Maintenance problems. Future spare parts problem.
M&I, Capability, 40: System functionality is marginal. Sytem function is mixed with tank pressure , level.
M&I, Infrastructure, 40: System is a continuous user of instrument air.

Additional Information & Affected Projects

H&S, Health Physics, 35: Maintenance of system may expose workers to radiation.

Shaded Areas Are Not For Use

WHC-SD-W314-ES-018, Rev 0

CAMP RATING FORM

Project Title: 244-A DCRT; LIQUID SURFACE LEVEL INST. SUBSYSTEM

B&R Code: _____ Rev #: _____ FY: _____

Project Id #: DA.14.4 FUDS: _____

Subcategories	Major Categories			
	H&S	ER/WM	S&S	M&I
Compliance with Orders etc.				
Technological Base (R&D)				
Industrial Hygiene				
Industrial Safety				
Fire Protection				
Health Physics	35			
Criticality				
Infrastructure				40
Liquid and Hazardous Waste				
Solid and Hazardous Waste				
Airborne Pollutants				
Waste Minimization				
Environmental Restoration				
Corrective Activities				
SNM Accountability				
Protection of SNM				
Protection of Classified Information, etc.				
Protection of Property from Theft & Loss etc.				
Protection from Hostile Action				
Business Benefits				
Mission Capability, Capacity, & Quality				40
Asset Condition				40
National Business Strategies/Partnerships				
Highest of Each Subcategory	35	20	20	40

PROJECT RATING:	42
Final Project Rating	42

Note: 20 is a Default Rating

C. D. Acree		9/29/95
Rated By	Ext	Date Rated
Reviewed By	Ext	Date Reviewed

Applicable Regulations or Policies

M&I, Asset Condition, 40: Aging system, Maintenance problems, future spare parts problem.
M&I, Capability, 40: system functionality is marginal. System function is mixed with pressure & SpG sys
M&I, Infrastructure, 40: Poor resolution of level gauge exacerbates mass balance computation
for checking waste transfer operations.

Additional Information & Affected Projects

M&I, Infrastructure, 50: System is continuous user of instrument air.

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10.0 244-S DCRT

No assessment was made on this facility. However it is expected that the results would be similar to the 244-A DCRT findings.

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11.0 241-SX TANK FARM

No assessment was made on this facility. See the HVAC assessment for further information.

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12.0 OTHER FACILITIES

12.1 Inter-Farm Piping

For assessment information relating to instrumentation and control systems relating to piping within the tank farms, see each individual facility data section.

12.2 13.8 KV Distribution Lines

This section is not applicable.

12.3 Data Acquisition Computer Systems.

Initial assessment information pertaining to the TMACS, SACS, DACS and CASS data acquisition systems and there associated control rooms was not obtained for this report. This information will become available during the additional assessment phase. Document WHC-SD-W314-ES-024 will contain this information.

12.4 Evaporator Interfaces - Master Pump Shutdown

A part of the Master Pump Shutdown facility is located in the 242-A Evaporator building in the 200 East Area. It integrates all of this function for the 200 East Area Tank Farm complex. The relaying controls in this facility must receive the same assessment rating as the balance of the Master Pump Shutdown system located in the other Double Shell Tank Farms. It is also being recommended for upgrade along with the balance of the Master Pump Shutdown circuitry.

Another part of the Master Pump Shutdown facility is located in the 242-S Evaporator building in the 200 West Area. It integrates all of this function for the 200 West Area Tank Farm complex. Since this subsystem does not allow any versatility in the establishment of pump permissive circuitry, the subsystem (relaying controls) in this facility must receive the same assessment rating as the balance of the Master Pump Shutdown system located in the SY Double Shell Tank Farm. It is also being recommended for upgrade along with the balance of the Master Pump Shutdown circuitry.

12.5 Tank Farm Instrument Air Systems

A limited assessment of the instrument air systems was carried out. The effort consisted primarily of field inspections. The Inspector's summary sheets are attached in the balance of this section.

Facility: 241-AN-273 Instrument Air Compressor CAS Narrative

Date: 10/31/95

Equipment Description

SA-CMP-101 is a Joy Air-Pac compressor; date of installation is unknown. This is a non-lubricated (or "oil free"), single-stage, water-cooled, packaged compressor providing instrument air for the 241AN Tank Farm. The condensing unit serving this compressor utilizes glycol refrigerant. Air from this compressor passes through a regenerative desiccant air-drying system. There is a 120 gallon accumulator tank situated inside the compressor building. Air is tapped from the bottom of the accumulator tank and passed through a combination of air filter/oil filter/dryer cartridges (constant bleed mode). There is no instrumentation specifically intended to monitor air quality.

System Condition Summary

Visual CAS inspection revealed little in the way of deficiencies, however two unsafe conditions were noted: pressure relief valves SA-PRV-101 & 102 are not equipped with outlet piping which would divert air discharge in the event valves should lift. As currently positioned, both valves would release high-pressure air toward the main body of the compressor room, creating potential for personal injury should this space happen to be occupied during an overpressurization event.

The compressor is in the "constant speed" operation mode, i.e., runs continuously while unloading and loading between system pressure set limits. The compressor was observed to load approximately every 15 - 20 seconds. This could be attributed to improper unloader adjustment, undersized discharge piping or storage capacity, or, most probably, system air utilization (due to equipment demands, system leakage, and the secondary filter/dryer operation).

The compressor realizes benefit of a semi-annual PM, which addresses inspection and replacement (as necessary) of valves, oil, and filters; and an annual Class "A" PM which constitutes major overhaul of mechanical components. Discussions with maintenance crafts revealed this unit to be reliable and well-maintained.

System Summary Condition

The physical condition of SA-CMP-101 and ancillary components/equipment in and around 273AN is rated as "good" (8) (excluding the non-existent PRV discharge piping, which is deemed "fail" and recommended for prompt resolution).

Facility: 241-AP-273 Instrument Air Compressor CAS Narrative

Date: 11/07/95

Equipment Description

SA-CMP-301 and SA-CMP-302 are a Joy Air-Pac compressors; dates of installation are unknown. These are non-lubricated (or "oil free"), single-stage, water-cooled, packaged compressors providing instrument air for the 241AP Tank Farm. The condensing unit serving these compressors utilizes glycol refrigerant and features a relatively new glycol chiller unit. Air from these compressors passes through a regenerative desiccant air-drying system. There is a 200 gallon accumulator tank situated inside the compressor building. There is no instrumentation specifically intended to monitor air quality.

System Condition Summary

No maintenance deficiencies were noted relative to either compressor, however, light oil residue was observed to be covering both bases. Pressure gauges on each of the respective air dryer towers are erroneously labelled, ie., gauge on one tower bears the tag for the gauge on the other - tags appear to have been switched.

The "on-line" compressor (301) is in the "constant speed" operation mode, ie., runs continuously while unloading and loading between system pressure set limits. The compressor was observed to load approximately every 2+ minutes; no excessive cycling was observed.

The compressors realize benefit of semi-annual PM's, which address inspection and replacement (as necessary) of valves, oil, and filters; and annual Class "A" PM's which constitute major overhaul of mechanical components. Discussions with maintenance crafts revealed both units to be reliable and well-maintained.

System Summary Condition

The physical condition of SA-CMP-301, SA-CMP-302, and ancillary components/equipment in and around 273AP is rated as "good" (9).

Facility: 241-AW-273 Instrument Air Compressors CAS Narrative
Date: 6/27/95

Equipment Description

Two non-lubricated (or "oil free") single-stage, packaged compressors providing instrument air for the East Tank Farms are housed in this facility. These are water-cooled units. Air from these compressors passes through a regenerative desiccant air-drying system (towers are switched manually). There is a single 120 gallon accumulator tank situated at the north side exterior of the building (the tank is completely encased in insulation which prohibits access and prevented visual inspection).

AW #1 is a Joy Air-Pac (7.5 x 5); date of installation is unknown.

AW #2 is an Ingersoll-Rand ESV-1 (9 x 7) which was transferred from 400 Area and installed in the 1992 timeframe. Condensing units serving each respective compressor utilize glycol refrigerant.

System Condition Summary

Visual CAS inspection revealed little in the way of deficient conditions. Light oil residue was noted at the base of the framehead distance piece where it abuts the bearing case on the IR unit. A magnahelic gauge monitoring inlet air DP to the Joy compressor (mounted against the north wall) was registering "no reading" at the time of inspection. No obvious deficiencies were observed relative to the drying towers, aftercoolers, piping, glycol pumps, or condensing units. Both compressors are in the "constant speed" operation mode, ie., run continuously while unloading and loading between system pressure set limits. The compressors were observed to load approximately every 30 - 50 seconds. This could be attributed to improper unloader adjustment, undersized discharge line size or storage capacity, or, most probably, system air utilization (due to equipment demands and system leakage).

The compressors realize the benefit of a semi-annual PM, which addresses inspection and replacement (as necessary) of valves, oil, and filters; and an annual Class "A" PM which constitutes major overhaul of mechanical components. Discussions with maintenance crafts revealed both units to be reliable and well-maintained.

System Summary Condition

The physical condition of the instrument air compressors and ancillary equipment in and around 273AW is rated as "good" (7).

Facility: 242S Instrument Air Compressors CA Narrative

Date: 12/06/95

Equipment Description

Two non-lubricated (or "oil free") single-stage, packaged Ingersoll-Rand compressors provide instrument air in this facility. CP-E-1 is currently on-line; CP-E-2 is in standby. Both compressors are water-cooled; a relatively new condenser serves these units. Glycol refrigerant is used in this system.

Air from the compressors passes through a regenerative desiccant air drying system (twin towers). There is also a single large accumulator tank (estimate capacity is 500 gallons).

Deficiency Summary

Visual CAS inspection revealed no significant deficiencies. Both compressors and all ancillary equipment appear to be well maintained and in good condition. CP-E-1 is in "constant speed" operation; load cycle time is approximately 50 - 60 seconds, with no excessive cycling noted (lag between cycles is in excess of 2 minutes). No air leaks were observed, although there is light oil residue on the framehead distance piece of each unit.

System Condition Summary

The overall physical condition of the instrument air compressors and associated equipment in 242S is rated as "good" (8).

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13.0 ASSESSMENT ENGINEERING ANALYSIS

ANALYSIS OVERVIEW

This Engineering Analysis of the Instrument, Control Systems and Data Acquisition Systems is based on suspected Regulatory Compliance Issues, known maintenance problems and operational deficiencies, and a review of the Engineering drawings. This narrative does not summarize all the deficiencies found by the field inspection but focuses on the design deficiencies of the Engineered System. In the narrative, deficiencies or concerns are highlighted by *italics* type. A reference list will be found at the end of the narrative.

The Instrumentation and Control (I&C) Systems in use in the Double Shell Tank (DST) Farms and the DCRTs are composed of several major system types, of which each may contain several minor subsystem. The designs for these I&C Systems and subsystems are very similar, if not identical, between the various DST farms. Block diagrams have been assembled for each farm where each block, on the diagram, represents a major System, Structure or Component (SSC) in the I&C Systems. Each block in the diagrams has a unique reference number so that all assessment documentation can be keyed to a specific SSC.

The major Instrument & Control Systems and their reference numbers are listed as follows:

<u>Major I&C System</u>	<u>Reference Number</u>
Leak Control System	I1
Ventilation Control System	I2
Transfer Line Control System	I3
Tank Contents Monitoring System	I4
Tank Contents Mixing Control Systems	I5
SSC Status & Monitoring System	I6
Heat Trace Control System	I7
Cathodic Protection Control System	I8

Local Alarm Display System

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There are three major real time data acquisition systems in use in the Tank Farms. They are the:

Tank Monitoring and Control System (TMACS) C1.1

Surveillance Analysis Computer System (SACS) C2.1

Computer Automated Surveillance System (CASS) C3.1

These systems were not assessed during the "Initial Assessment".

Additional systems which support the Instrumentation and Control Systems are the:

Communication Systems that support these computer system. They are the CASS communications cable, the Hanford Local Area Network (HLAN), and the public telephone system.

This system was not assessed during the "Initial Assessment".

Instrument Air System that support the various pneumatic instrument systems and purge air systems. Tank Farm Operations is very interested in eliminating or at least minimizing the use of instrument air compressors in the tank farms.

This system was not assessed during the "Initial Assessment".

11. LEAK CONTROL SYSTEM

The Leak Control System is comprised of several subsystems associated with the tanks and the transfer piping within a farm. Individual Tank Farm Pumping Control Systems are affected and permitted by the Tank Farm Leak Control System and by other Tank Farm Leak Control Systems. These systems are related by shared waste transfer routes.

Each DST Farm contains Tank Primary Containment leak detection equipment, Tank Secondary Containment leak detection equipment and Waste Transfer Pipeline leak detection equipment. The DCRT has Primary Containment leak detection equipment and Waste Transfer Pipeline leak detection equipment, but no Secondary Containment leak detection equipment.

11.1 LEAK DETECTION PIT/SUMP INSTRUMENTATION

Leak Detection Pits and their Sumps contain instrumentation that is used to detect leaks from Tank Secondary Containment. In the AW, AN, SY, AY and AZ DST farms, a leak detection pit is associated with each tank. The AP DST farm has two leak detection pits with half the tanks being served by each pit. A leak detection pit has an associated pump pit near the surface of the ground in the tank farm and it has a sump that is below the bottom of secondary containment. The pit and sump are connected together by a long well. The sump is connected by pipe to a series of channels cut into the surface of the structural support concrete pad. This pad support the secondary tank wall. An external well (thimble) extends from the leak detection pump pit to a point just outside of the sump and provides access for the radiation probe.

Leak Detection Pit Sumps contain a temperature (thermocouple) sensor and pressure pickup tubes for a Specific Gravity - Weight Factor pneumatic system. A gamma radiation detector is located just outside of the sump wall and would see the "shine" from any radioactive material that would leak into the sump. The leak detection pump pit has a liquid presence sensor located near its drain.

11.1.1 Gamma Radiation Monitoring Subsystem

The major components and structures of the Leak Detection Pit Sump Gamma Radiation Monitoring Subsystem are the Gamma Probe Well (Thimble) Structure, the Gamma Probe Assembly and its signal cable, which is located inside the well, the Field signal cable, which is located in the farm, and the Count Rate Meters, which are located in the tank farm instrument building.

The Gamma Probe Wells [1.1.1.1] in the DST farms are not sealed at the top. Thus liquid and humidity can enter the well. The humidity condenses on the walls of the well and accumulates along with any water seepage in the bottom of the well. These wells do not have an egress for the accumulated liquid. ***Some times the water level is high enough to cover the Gamma Probe assembly.***

The Gamma Probe Assembly [1.1.1.2] is comprised of two detectors. One is a wide range detector and the other is a more sensitive, narrow range detector. These detectors are suspended at the end of the signal cable (RG-59) and sit at the bottom of the Gamma Probe Well. ***The connector that attaches the detectors to the signal cable is not rated for underwater operation. Thus, when the detectors are submerged, water causes distortion of the signal. Attempts to "fix" the problem by encapsulation of the sensors has met with limited success.***

The Field Signal Cable [1.1.1.3] is contained in buried conduit in the tank farm. The conduit generally terminates at the tank farm instrument building at a floor channel. The signal cable is then carried on to terminate on the Instrument Preamplifiers. ***The condition of this cable is unknown. In some Wells, there are splices in the area near the entry to the Gamma Probe Well. These appear to be potted in some kind of silicone compound. The integrity (water tightness) of the potting and connection is unknown.***

The Count Rate Meters [1.1.1.5] are NIM bin based nuclear counting equipment. Associated with the Count Rate Meters and located in the NIM bin are the Instrument Preamplifiers. The Instrument Preamplifiers are a Hanford Designed Nuclear Preamplifier and a "batch" of these units were manufactured specifically for these installations. ***Obtaining spare units may not be possible, since these are not a standard Vendor item. Problems have been reported in some of the tank farms with erratic operation of this system due to 60 Hertz interference. It is unknown where this interference occurs, but the effect can be an unreliable system.*** This equipment was installed in the mid 70s. It is conjectured that there may be problems with the power supplies due to aging electrolytic capacities although this has not been verified.

11.1.2 Specific Gravity & Weight Factor Monitoring Subsystem

The major components of this system are the Sample Tubes (dip tubes), which are located in the Leak Detection Pit Sump; the Weight Factor & Specific Gravity Pressure Sensors, which are located in the Transmitter Enclosures (located near the leak detection pit); the Field Tubing, which is located underground in the tank farm; the Weight Factor & Specific Gravity Pressure Switches located in the tank farm

instrument building; and the associated alarm indicators located on the Instrument Panel in the tank farm instrument building.

The Sample Tubes [I1.1.2.1] tubes originate in the Transmitter Cabinet and proceed underground to the Pit and subsequently down the Leak Detection Pit Well to the Sump. Two tubes, each at a different level, are immersed in water maintained in the Leak Detection Pit Sump and the other is suspended in air in the Well. Air is metered into the tubes at a constant flow rate and the differential pressure is measured between each of the immersed tubes and the air tube. ***In order for this system to operate it is necessary to add water to the Sump and maintain a minimum/maximum level in the Sump. For this reason, the Sump is sometimes called a "Wet Pit".***

The Weight-Factor and Specific Gravity Pressure Sensors [1.1.2.2] measures the pressure across the two immersed tubes. This pressure varies because of changes in the level of liquid in the Sump or because the density of the liquid in the Sump has changed. These Pressure sensors are pneumatically operated and embody a pneumatic pressure transmitter. The output of the pressure transmitter is sent (instrument air signal) via under ground tubing to the Pressure Switches and Indicators in the tank farm Instrument Building in all DST except for AP farm. The output from the Pressure Sensor in AP farm is converted to an electrical signal and that electrical signal is sent to the tank farm Instrument Building via underground conduit & wiring.

An algorithm is utilized to relate the pressures to equivalent inches of water for level measurement, Weight-Factor and Specific Gravity. Level or liquid presence is the data variable required for a liquid in the Sump. It is arguable that the existing type of W-F/SpG system could differentiate between a pit full of water and a slight infiltration of Waste Liquid. The system is basically can not be calibrated for the desired variable. Only the Pressure Sensor is calibrated and it is calibrated in units of pressure, not inches of water or Specific Gravity. The PDRD should re-assess the need for density information for the liquid in the pit.

Most of the farms utilize the Foxboro Pressure Transmitter. ***This Pressure Transmitter is based on a design that is almost 50 years old. Although there have been improvements to these Pressure Transmitters over the last few decades, it is unlikely that these devices will be manufactured much longer. Spare parts procurement is expected to become increasingly difficult.*** New technology, incorporating electronics, is commonly available from all Manufacturers.

The Weight-Factor Cabinet (Transmitter Enclosure) [I1.1.2.3] contains not only the Pressure Sensor-Transmitters, but all the accessory instrumentation, tubing and

valves necessary to make the Weight-Factor & Specific Gravity System to work. In order to obtain the level data measurement for one leak detection pit, the following list of equipment is required:

TRANSMITTER ENCLOSURE

- 3 ea manual read air flow meters
- 3 ea pressure transmitters
- 3 ea manual read pressure gauges
- 4 ea manual adjust globe valve
- 3 ea manual adjust globe valve
- 1 ea pressure reducing station and manual read pressure gauge
- 1 lot of misc. tubing, fittings, manifolds, and an instrument frame

PRESSURE SWITCH RACK

- 1 ea pressure actuated electrical switches
- 1 lot of misc. tubing, fittings, manifolds, and an instrument frame

INSTRUMENT PANEL

- 1 ea Specific Gravity Indicators
- 1 ea Weight-Factor Indicators

The meters, gauges, pressure switches and indicators must be periodically calibrated. Calibration errors stack up in this type of system. Maintenance is exacerbated by the sheer number of components and the system requires a skilled maintenance worker to tune up. There are 22 Leak Detection Pits in service in the 6 DST farms, thus the complexity is complicated by sheer numbers.

The Field Tubing [I1.1.2.4] carries the instrument air signal from the pressure transmitters located in the Transmitter Enclosures to the Pressure Switches & Panel Indicators in the tank farm Instrument Building. This tubing is direct buried and in contact with the soil. ***Its life expectancy is unknown.*** The following list tabulates the approximate number of years that this tubing has been in the ground.

AW Farm	15 years
AP Farm	(Tubing is not installed in the ground for this system.)
SY Farm	19 years
AY Farm	25 years
AZ Farm	18 years

AN Farm 14 years
244-A DCRT 19 years

The Weight-Factor and Specific Gravity Pressure Switches and Associated Indicators [I1.1.2.5] implement the alarm function and provide indication as to the level and weight-factor of the liquid in the Leak Detection Pit.

I1.2 ANNULUS LEAK INSTRUMENTATION

Annulus leak detection instrumentation sense leakage from Tank Primary Containment. One type of these system is inserted into the tank annulus through a tank annulus riser and detects liquid presence by direct contact. The AW, AN, SY and AP use a similar type of a liquid presence sensor probe. The AY and AZ farms utilize a different type of liquid presence probe.

The other leak detection system related to primary containment leak detection is an inferential system and it infers a leak by the detection of radioactive particulate on an air filter. This system is associated with the Annulus Ventilation System.

There is also a leak presence sensor located in the Annulus Pump Pit. This detector senses liquid that has drained into the Annulus Pump Pit.

I1.2.1 Annulus CAM Radiation Monitoring System

The major components and structures of the Annulus CAM Radiation Monitoring System are the Air Sampler Probe and Sample Tubing, which is located in & on the Annulus Ventilation System Exhaust Duct in a Ventilation Pit; the Radiation Analyzers, which are located in the Instrument Cabinet; the Instrument Cabinet and its support equipment, which is located in the Ventilation Pit; the Multi-pen Chart Recorders & associated Alarm equipment located in the tank farm Instrument Building; and Signal Wiring & Conduit buried in the tank farm.

The Air Sampler Probe and Sample Tubing [I1.2.1.1] is located in the Annulus Duct typically at a Ventilation Pit. The Ventilation Pit is a location where the underground ventilation ducting from the annulus exhaust riser is made accessible. ***See Attachment 1 in this section.***

The Radiation Analyzer [I1.2.1.2] is a Eberline Alpha 3 type. It embodies both the sample holder, sample shielding pig and electronics in the same cabinet. ***The device weighs over 100 pounds and is hard bolted into the cabinet (except AP farm where it is mounted on a slide tray). This make the device difficult to handle***

for maintenance & calibration activities. Additionally, the recommended Continuous Air Monitor (CAM) presently recommended for use on the site is the ALPHA 4 unit. This device is generally removed for calibration.

The Analyzer Cabinet [1.2.1.3] *is not dust tight or moisture tight. Indicating lamps on top appear to be installed without moisture/water seals.* Equipment is not generally mounted on slide out trays which makes maintenance difficult.

The Three-pen Recorders and Associated Alarm Equipment [1.2.1.4] are located on the Instrument Panel in the tank farm Instrument Building. There are two recorders. Each recorder trace (color) is associated with the annulus air stream radiation level for each tank. This recorder can be calibrated in place. *This recorder is not connected to any computerized database, so record keeping requires that the recorder charts be stored/filed. This archival function should be automated.*

The Signal Wiring and Conduit [1.2.1.5] connects the CAM Analyzers with the 3-pen Recorders. This wiring is direct buried in all farms except AP farm. The following list tabulates the approximate number of years that this wiring has been in the ground.

AW Farm	15 years
AP Farm	9 years (in conduit)
SY Farm	19 years
AY Farm	25 years
AZ Farm	18 years
AN Farm	14 years
244-A DCRT	19 years

11.2.2 Annulus Liquid Presence Sensors

Two types of annulus liquid presence sensors are utilized in the DST farms. A device called the "Flake Box & Manual Tape Conductivity Probe" is utilized on AW, AN, AP and SY. A "Multi-point Conductivity Probe" is utilized on the AY and AZ DST and has been abandoned on the SY DST. These devices are installed three to a tank, one in each tri-sector. *However, the SY tanks only have one such device in each tank.*

The Flake Box & Manual Tape Conductivity Probe is inserted into an annular riser in the DST. This device has a tape reel which is used to lower an electrical probe to the annulus floor. *This device has a plastic housing and the contents are under*

continuous purge air. The plastic is susceptible to Ultraviolet damage. This device is a Hanford design and is expensive to fabricate.

A portable ohmmeter is used to determine when the probe make contact with a liquid or the floor. The probe is "parked" approximately 0.25 inch from the bottom of the annulus. If liquid should accumulate in the annulus, it will eventually contact the probe. Manual readings are taken periodically and a continuity reading would indicate a potential leak.

This device does not comply with regulatory requirements. The sensitivity of this device depends on how close the operator has gauged the distance to the bottom of the tank. There is no calibration capability for these devices. The frequency of surveillance for these devices indicates that they should be automatically read. This device is not connected to any computerized database, so record keeping requires that the Operator Rounds tables be stored/filed. This archival function should be automated.

The Multi-point Conductivity Probe is also inserted into an annular risers in the DST. This device consists of a pipe with 17 conductivity probes aperiodically located from its bottom, near the bottom of the annulus, to about six feet above its bottom. It provides both a leak detection function and a crude liquid level measurement function. An electrical wire cable is buried underground from the probes at the tanks to the tank farm instrument building. This device is also readout by a portable ohmmeter. A switch is used to select which pair of probes are brought to the ohmmeter jacks. If liquid should accumulate in the annulus, it will eventually contact the probe. Manual readings are taken periodically and a continuity reading would indicate a potential leak.

This device does not comply with regulatory requirements. The sensitivity of this device depends on how close the installer has gauged the distance to the bottom of the tank. There is no calibration capability for these devices. The frequency of surveillance for these devices indicates that they should be automatically read. This device is not connected to any computerized database, so record keeping requires that the Operator Rounds tables be stored/filed. This archival function should be automated.

The life expectancy of this direct buried wire is unknown but its total life expectancy (present age plus future life) probably will not exceed 40 years.

11.3 PIPELINE LEAK INSTRUMENTATION

Waste Transfer Pipeline leak detection takes place in various pits located at diversion points for Waste Pipelines. These pits contain "jumpers" or "valve manifolds" which are used to route the waste stream to/from the various tanks and processing facilities within the tank farm complex. These pits are generally equipped with drains and have sloped bottoms to encourage the liquid to runoff the concrete floor. A liquid presence sensor is located near the drain. These detectors provide primary leak detection for the jumpers and valves located in the pits.

Double shell pipelines may have additional leak detectors which are designed to detect leaks from Primary pipeline containment into the annular region of the Double Shell Pipeline. A piping arrangement conducts liquid from within the annular region, at the point of entry to a pit, to a special valve structure which contains a liquid presence sensor. Not all pipelines have this feature.

11.3.1 Clean Out Box Liquid Presence Sensors

Some of the Double Shell Pipelines have Clean Out Boxes (COB) located periodically enroute. These COB have drains and the Liquid Presence Sensor is located near the drain. The Liquid Presence Sensor has two electrical electrodes located on its bottom which are typically located one inch from the floor of the COB. ***This one inch spacing from the floor constrains the sensitivity of the detector by requiring at least a one inch level of liquid to accumulate before the detector will sense the liquid.*** The detector must pass an electrical current through the liquid between its electrodes before a leak is detected. If the COB drain is plugged, a small amount of liquid (depends on the dimensions of the COB) will actuate the detector. ***If the drain is open, a small flow could pass by without actuating the detector. Regulations require that any leakage be detected.***

This design utilizes direct burial rated electrical wire or "SO" cord to connect the leak detector (located in the pit) to the Leak detector Station terminal box. The design does not specify a conduit connection for this so there is an electrical wire (insulated) suspended from the terminal box to the COB. This is not good design practice as this is a permanent installation.

11.3.2 Pipeline Pressure Switches monitor the secondary containment (annular region) on a few double shell pipelines in some tank farms. They are utilized in conjunction with a purge air flow and a liquid leak trap to monitor a leakage into the annular region of the pipeline. If a liquid leak occurs in the primary pipeline containment into the annular region, it will drain to the liquid leak trap which is located in a pit. When the leak trap fills, a blockage is formed which creates a pressure increase. This pressure increase is sensed by the pressure switch and activates a leak alarm.

The liquid leak trap contains a valve which, when shut, makes it possible to pressure test the secondary containment pipeline.

The sensitivity of this type of leak sensor is unknown. There is no easy way to verify the operability of this type of sensor. Calibration of this type of leak detection system is difficult and would involve filling the trap with a liquid. This type of sensor is also a consent user of instrument air.

11.3.3 Transfer Pit Leak Detection Instruments can be found in the following pits:

- Central Pump Pits
- Annulus Pump Pits
- Valve Pits
- Feed Pump Pits
- Flush Pits
- Drain Pits
- Leak Detection Pits

These pits are typically concrete boxes installed so that their surface is flush with the top of the ground. In Process pits, several shielding cover blocks are placed over the operating area of the pit. Other pits may use steel plates. ***These cover blocks and plates do not effect a raintight seal, with the consequence that there is water infiltration due to rain and snow melt. This water can and does cause false alarms form the liquid presence leak detection sensors.*** Many of these pits have moisture condensing on the walls and the bottom of the cover blocks. ***The liquid that derives from the condensing moisture can also lead to false alarms.***

These pits all have sloped floors leading to a drain. Generally, this drain is not plugged but it can be in many cases.

There are a two different types of liquid presence leak detectors [11.3.3.1] in use in the DST farm pits. Each pit has a leak detector which is located in the bottom of the pit near the drain. This liquid presence sensor has two electrical electrodes located on its bottom which are typically located one inch from the floor of the Pit. ***This one inch spacing from the floor constrains the sensitivity of the detector by requiring at least a one inch level of liquid to accumulate before the detector will sense the liquid.*** The detector must pass an electrical current through the liquid between its electrodes before a leak is detected. If the Pit drain is plugged, a small amount of liquid (depends on the dimensions of the Pit) will actuate the detector. ***If the drain is open, a small continuous flow could pass by without actuating the detector. Regulations require that any leakage be detected. Pit sensor are not anchored to the floor so their position with respect to the floor drain is not***

guaranteed. Maintenance/Operations activities have been known to upset this sensor and/or move it out of place.

This design generally utilizes either direct buried wire or "SO" electrical wire to connect the leak detector (located in the pit) to the Leak detector Station terminal box. Some tank farms run this wire in conduit. In most tank farms, the design does not specify a conduit connection for this so there is an electrical wire (insulated) suspended from the terminal box to the Pit. This is not good design practice. Burial of "SO" cord or putting it in conduit is a violation of the National Electrical Code (NEC). The life expectancy of direct buried wire is unknown but its total life expectancy (present age plus future life) probably will not exceed 40 years. The total life expectancy of "SO" cable exposed to the environment is, at best, several years. The AP tank farm is the exception with all the wires being installed in conduit.

These types of liquid presence sensors are not mounted (bolted) to the floor of the pit. And sense it is connected by a flexible wire, there is nothing to constrain it a fixed location. Activities in the pits (install/removing jumpers) can move the sensor from its optimum location and can even result in it being turned over.

This type of sensor design can not be tested electrically for operability. There is no way to know if the sensor is operable unless a bucket of water is dumped on it. And, this is not a practical approach to sensor operability verification.

The pipeline annular liquid presence leak detector [1.3.3.1] is utilized to detect leakage in the annular region of double shell pipelines. Double shell pipelines are sloped back to one of the pits. Any leakage from the Primary pipeline containment will drain back to the pit. The annular region liquid drainage is conducted to a small pipe that is connected to a special "pipe tee" which has a single electrical probe inserted into it. Liquid that collects in this tee will complete an electrical circuit between the probe and the pipe.

This design generally utilizes direct buried wire to connect the leak detector (located in the pit) to an intermediary terminal box. Some tank farms use "SO" wire. The life expectancy of direct buried wire is unknown but its total life expectancy (present age plus future life) probably will not exceed 40 years. "SO" cable will last, at best, several years. Conduit & wiring is run from this terminal box to the Leak Detector Station terminal box.

This type of sensor design can not be tested electrically for operability. There is no way to know if the sensor is operable.

The Leak Detector Station Terminal Boxes [I1.3.3.2] are mounted on a Unistruct frame located near the pit where the leak detector is installed. The Leak Detector Stations contain the current sensitive relays which detect the current flow through the electrodes (probes) of the liquid presence sensor and determines whether there is liquid in the pit. ***There is no calibration capability for these relays. They are periodically functionally tested. Therefore, their sensitivity is unknown. This makes it even more difficult for the system to comply with regulatory requirements.***

The Leak Detector Station terminal boxes also have alarm indicator lamps mounted on the top of these boxes. These boxes are supposed to be dust tight and rain tight by design. ***However, the indicator lamp bases were installed in such a way as to violate the NEMA rating of the terminal boxes, and consequently the integrity of the terminal boxes was ruined.***

The Pit Signal Wiring [I1.3.3.3] utilized to connect the Liquid Presence Sensor to the Leak Detector Station is either "SO" cable or direct buried cable. It is not run in conduit inside the pit. But it exits the pit and runs underground to the conduit that rises to the Leak Detector Station. ***This is not good design practice as the cable is unsecured. It is a violation of the National Electrical Code (NEC) to run "SO" cable underground or in conduit. The life expectancy of "SO" cable exposed to the environment is at best several years.***

The Field Signal Wiring [I1.3.4] is direct burial wire and connects the Leak Detector Stations to each other and to the Master Relay Panel in the tank farm Instrument Building. ***The life expectancy of direct buried wire is unknown but its total life (present age plus future life) probably will not exceed 40 years. In most of the DST farms, many of the Leak Detection Station current sensitive relays are wired in series (except AP tank farm). This make it difficult to determine exactly which Leak Detector has caused an alarm without going in to the tank farm to observe the indicating lamp on top of the Leak Detection Station terminal boxes.***

The Encasement Leak Detection Instrumentation [I1.3.5] is similar to that described in I1.3.3. ***The concerns are similar.***

I1.4 PUMP PERMISSIVE INSTRUMENTATION (Master Pump Shutdown)

The Pump Permissive instrumentation utilizes signals derived from the various leak detection systems to permit the operation of transfer pumps inside and outside of the tank farms. The Pump Permissive function enables a transfer pump to start and continue operation but it does not automatically start a pump. (Starting pumps is presently a manual Operator function.) The Pump Permissive function

will stop a transfer pump if a leak detection sensor has detected a liquid level. This is the Master Pump Shutdown (MPS) function.

In the East Area (likewise the West Area), all the leak detection circuits are connected together in such a manner so that a leak alarm anywhere (in most farms and connecting pipelines) will shutdown pumping activities anywhere along several waste transfer routes. False alarms, usually caused by rainwater infiltration into the various pits, can cause the shutdown of a waste transfer operation. This means that a false alarm in a tank farm can cause the shutdown of a waste transfer operation between two other farms even if there is no shared pipeline connection.

The Pump Permissive Instrumentation is implemented primarily in the Master Relay Panel, which is located in the tank farm Instrument Building. There is a Master Pump Shutdown Control Button located on the tank farm Instrument Building Instrument Panel and at other control room locations. The tank farm relay panels are interconnected via a set of relay panels located in the evaporator control rooms (242-A and 242-S). ***Since all this instrumentation is electrically connected together, it is sometimes necessary to remove a sensor circuit in order to establish a waste transfer route. This requires the preparation of a temporary Engineering Change Notice (ECN) and subsequent field modification. Ultimately, this ECN must be voided and the field modification undone.***

The Tank Farm Master Pump Shutdown Relay Panel [I1.4.1] contains a large number of relays that are connected to implement the permissive control logic necessary to enable the various transfer pumps. Generally, these relays have two sets of control contacts. One set of contacts implements the Master Pump Shutdown function and the other set implements the Leak Alarm (actuates the PANALARM lights) function. Since these relays are "hard wired" together there is no versatility in establishing the isolation or protection of a specific waste transfer route.

The MPS Pushbutton Control Panels [I1.4.2] located in 244-AR, 271-A, 242-A, 242-S, and 242-T do not appear to be designed in accordance with NUREG 700 guidelines.

The Signal Wiring [I1.4.3] that connects the tank farm Master Relay Cabinet to the Control Room (242-A) relay cabinet is direct buried wire. The life expectancy of direct buried wire is unknown but its total life expectancy (present age plus future life) probably will not exceed 40 years.

The Control Room (242-A & 242-S) Relay Panel [I1.4.4] combines pump permissive signals from the tank farms Master relay Panels and cross site waste transfer leak detection systems into the Master Pump Shutdown function. ***This relay system is "hard wired" and provides no versatility for implementation of waste transfer route leak detection protection.***

I1.5 LOCAL ALARM ANNUNCIATION PANEL

There are two basic types of alarm annunciator panels associated with the tank farm equipment. These are the main alarm indicators located on the Instrument Panel in the tank farm Instrument Building, and alarm indicators or lamps located on equipment or terminal boxes in the tank farm near the individual tanks or equipment. The PANALARM system typically has a remote alarm interface which sends data to the CASS system.

The tank farm Instrument Building Alarm Panel [I1.5.1] is a PANALARM type of display and generally is located at the top of the Instrument Panel. ***This panel does not appear to have been designed in accordance with NUREG 0700 guidelines for arrangement of alarms.*** However the indicators are for the most part large and easy to read.

The Tank Farm Alarm Panels [I1.5.2] are usually a few indicators mounted on a terminal box near equipment in the tank farms. These may be small status lights or large flashing lamps which are utilized to alert the Operator to trouble alarms on the Leak Detection Control Station terminal boxes and the Standard Hydrogen Monitoring System (SHMS) cabinets. ***The flashing lamps utilized on the Leak Detection Control Stations are a location where water infiltrates into the terminal box.***

The CASS Alarm Panel Interface [I1.5.3] connect the PANALARM indicators to the CASS system. ***This interface is obsolete for any other type of computer interface.***

I1.6 REMOTE ALARM SIGNALING (Gamewell Loop)

This system was designed to obtain alarm data from the various Leak Detection systems in the tank farms and to transmit this data to the CASS computer system at 2750E building. There is a 200 East Area system and a 200 West Area system. Each system is comprised of interface wiring to the various tank farm Master Relay Panels; Gamewell Alarm Loop Transmitters, which are located in instrument buildings and other process building; an electrical data transmission wire (typically

mounted on telephone poles) which connects all the Alarm Loop Transmitters together serially in an Area; a Gamewell Alarm Loop Reader, located at a main CASS multiplexer field unit; and a Gamewell interface board, located at a main CASS multiplexer, that converts the signal from a Gamewell pulse code to a digital binary code. The Gamewell interface board is connected to the CASS multiplexer field unit and the multiplexer transmits the alarm loop data to the CASS computer system.

This system can not identify a specific alarm. It can only identify a group (those on a loop) of alarms. Therefore an Operator is required to track down the specific alarm. This takes time. The system does not work very well and there have been numerous problems with the system over its lifetime. The 200 West Area Loop is not generally functional.

The Gamewell Alarm Loop Transmitters are obsolete. The technology was developed 50 or more years ago to monitor building fire alarm loops. They utilize a mechanical codewheel to transmit the address of the alarm loop that is alarming. These have to be reset when they are triggered.

The gamewell interface board was developed at Hanford during the CASS installation. The boards are not available as spare parts. The board has a long history of maintenance problems.

11.7 TANK WASTE HIGH LEVEL ALARM SUBSYSTEM

Each DST, except the SY tank farm, has a Tank Waste High Level Probe installed to detect potential overfill conditions. This probe is installed in its own riser and is in addition to the Waste Liquid Level Gauge that are installed in all DST. Intrinsic safety requirements may have been the cause of the removal of the High Level Probes in the SY tank farm.

The Waste Liquid High Level Probe [11.7.1] is basically a pipe with a set of electrical probes installed at the end. The electrical probes are connected, via wiring, to a current sensitive relay which is very similar to those in use by the Pit Liquid Presence Sensors. This probe is inserted through a riser and has its length measured so that the probes are at the maximum liquid level position. When liquid contacts the electrical probes, it conducts a current which actuates the current sensitive relay which in turn activates an alarm in the tank farm Instrument Building.

This type of sensor design can not be tested electrically for operability. There is no way to know if the sensor is operable unless the tank liquid level is raised to contact the probes. And, this is not a practical approach to sensor operability verification.

The High Level Alarm Relays [I1.7.2] are current sensitive relays which detect the current flow through the electrodes (probes) of the waste high level probes and determines whether there is liquid in the pit. There is no calibration capability for these relays. They are periodically functionally tested. Therefore, their sensitivity is unknown. This makes it even more difficult for the system to comply with regulatory requirements.

The Field Signal Wiring [I1.7.3] is direct burial wire (except for AP farm) and connects the Probes to the Master Relay Panel in the tank farm Instrument Building. The life expectancy of direct buried wire is unknown but its total life (present age plus future life) probably will not exceed 40 years.

I2 VENTILATION CONTROL SYSTEM

The Ventilation Control System is associated with two primary areas. These are the Tank Primary Ventilation Control System and the Tank Secondary Control System. The HVAC Engineering Analysis will deal specifically with some of these areas of Instrumentation.

I2.1 TANK PRIMARY VENTILATION SYSTEM

The Tank Primary Ventilation System is comprised of several systems and a few sub systems. These are divided into the following: The Tank Differential Pressure Instrument Subsystem, which is located at every DST, and the following systems located at the Central Exhaust Station: the HEPA Filter Differential Pressure Instrumentation; the Temperature Instrumentation; the Heater Control System; the Fan - Motor Control System; the Damper Control System and the Regulated Stack Monitoring System.

The various controls for damper operation, fan-motor control, heater control, etc. coupled with key pressure and temperature measurements are not integrated within a common electronic framework.

I2.1.1 Tank Differential Pressure Monitoring Subsystem

Each DST has a set of differential pressure gauges which monitor the tank's internal vapor space pressure. This pressure monitoring system is located in the same Transmitter Enclosures as the Leak Detection Pit Weight-Factor / Specific Gravity systems. The major components of the Pressure Monitoring System are: the Tubing from the tank vapor space to the pressure sensors, the Pressure Sensor-Transmitters, the Field Instrument Air Tubing, The Pressure Switch/Alarm rack, and the 2-Pen Recorders located in the tank farm Instrument Building.

The Tank Riser Tubing [12.1.1.1] originates in the Transmitter Cabinet and proceed underground to a tank riser and subsequently down into the tank vapor space. Purge air is metered into the tube at a constant flow rate and the differential pressure is measured

The Pressure Sensors/Transmitters [2.1.1.2] measures between an atmosphere connection and the tube to the tank riser. This pressure varies because of changes in the ventilation system. Two Pressure sensors are utilized to cover both a wide range of pressure and a narrow range of pressure (One gauge could not cover the entire range required). Pressure sensors are pneumatically operated and embody a pneumatic pressure transmitter. The output of the pressure transmitter is sent (instrument air signal) via under ground tubing to the Pressure Switches and Recorders in the tank farm Instrument Building in all DST except for AP farm. The output from the Pressure Sensor in AP farm is converted to an electrical signal and that electrical signal is sent to the tank farm Instrument Building via underground conduit & wiring.

Most of the farms utilize the Foxboro Pressure Transmitter. ***This Pressure Transmitter is based on a design that is almost 50 years old. Although there have been improvements to these Pressure Transmitters over the last few decades, it is unlikely that these devices will be manufactured much longer. Spare parts procurement is expected to become increasingly difficult.*** New technology, incorporating electronics, is commonly available from all Manufacturers.

The Transmitter Enclosure contains not only the Pressure Sensor-Transmitters, but all the accessory instrumentation, tubing and valves necessary to make the Differential Pressure System work. In order to obtain the pressure data measurement for one tank, the following list of equipment is required:

TRANSMITTER ENCLOSURE

- 1 ea manual read air flow meters
- 2 ea pressure transmitters
- 2 ea manual read pressure gauges
- 1 ea manual adjust globe valve (tubing)

- 1 ea manual adjust globe valve (pipe)
- 1 ea pressure reducing station and
manual read pressure gauge (shared with the SpG-WF system)
- 1 lot of misc. tubing, fittings,
manifolds, and an instrument frame

PRESSURE SWITCH RACK

- 2 ea pressure actuated electrical switches
- 1 lot of misc. tubing, fittings,
manifolds, and an instrument frame

INSTRUMENT PANEL

- 1 ea Chart Recorder
- 1 set Alarm Indicators

The meters, gauges, pressure switches and indicators must be periodically calibrated. Calibration errors stack up in this type of system. Maintenance is exacerbated by the sheer number of components and the system requires a skilled maintenance worker to tune up. There are 22 Tank Differential Pressure Systems in service in the 6 DST farms, thus the complexity is complicated by numbers.

The Field Instrument Air Tubing [I2.1.1.3] carries the instrument air signal from the pressure transmitters located in the Transmitter Enclosures to the Pressure Switches & Panel Indicators in the tank farm Instrument Building. This tubing is direct buried and in contact with the soil. ***Its life expectancy is unknown.*** The following list tabulates the approximate number of years that this tubing has been in the ground.

AW Farm	15 years
AP Farm	(Tubing is not installed in the ground for this system.)
SY Farm	19 years
AY Farm	25 years
AZ Farm	18 years
AN Farm	14 years
244-A DCRT	19 years

The Differential Pressure Switches and Associated Alarms [I2.1.1.4] implement the alarm function for both the wide range pressure monitoring and the narrow range pressure monitoring system.

The 2-Pen Pressure Chart Recorders [I2.1.1.5] are located on the Instrument Panel in the tank farm Instrument Building and provide indication and a permanent record

of the tank pressure. There is one recorder for each tank. Each recorder trace (color) is associated with either the high or low pressure ranges for a tank. This recorder can be calibrated in place. ***This recorder is not connected to any computerized database, so record keeping requires that the recorder charts be stored/filed. This archival function should be automated.***

The HEPA Filter Differential Pressure Instrumentation [12.1.2] is all manually read gauges and ***is not connected to any computerized database, so record keeping requires that the Operator Rounds Sheets be stored/filed. Since the behavior and operation of this equipment is critical to operation of the Primary Ventilation System, this archival function should be automated.***

The Temperature Instrumentation [12.1.3] is all manually read and ***is not connected to any computerized database, so record keeping requires that the Operator Rounds Sheets be stored/filed. Since the behavior and operation of this equipment is critical to operation of the Primary Ventilation System, this archival function should be automated.***

The Heater Control System [12.1.4] control electric heaters in all the DST except the SY tank farm. The SY farm uses steam heat and an steam control valve. The Controller receives input from both RTD, which are the primary control sensor and Thermocouples which are used for over temperature control. The electric heater controller is an SCR power controller.

The Fan - Motor Control System [12.1.5] is a simple start/stop manually operated system. The control circuits receive permissive start information from HVAC related instrumentation. ***There is no electronic monitoring of run-time or motor current or electronic database storage for maintenance history.***

The Damper Control System [12.1.6] utilizes some motor operated dampers, a motor operated valve and several manually operated dampers and valves. The motor operated equipment receives control and permissive information from other HVAC instrumentation.

Reserved [12.1.7]

The Regulated Stack Monitoring System [12.1.8] is located near the Main Exhaust Stack. This equipment consists of: a gas sample probe, located in the Main Stack; the sampling tubing, with trace heaters which connects the sample probe to the CAM Radiation Analyzers; the CAM Radiation Analyzers, located in the CAM Cabinet; the CAM Instrument Cabinet; the Vacuum pumps, which are located in

the CAM Instrument Cabinet; and the multi-pen recorder, located in the Control Room (242-A).

See Attachment 1. at the end of this section for further details.

The Probe and Tubing From the Stack to the CAM Analyzer [I2.1.8.1] is an iso-kinetic probe but ***was designed to operate over a narrow range. See Attachment 1 in this section for further concerns.***

The CAM Radiation Analyzer [I2.1.8.2] is an Eberline Alpha 3 type. It embodies both the sample holder, sample shielding pig and electronics in the same cabinet. ***The device weighs approximately 100 pounds and is hard bolted into the cabinet (except AP farm where it is mounted on a slide tray). This make the device difficult to handle for maintenance & calibration activities. Additionally, the recommended Continuous Air Monitor (CAM) presently recommended for use on the site is the ALPHA 4 unit. This device is removed for calibration.***

The CAM Cabinet [I2.1.8.3] ***is not dust tight or moisture tight. Indicating lamps on top appear to be installed without moisture/water seals.*** Equipment is not generally mounted on slide out trays which makes maintenance difficult.

The Vacuum Pumps [I2.1.8.4] are a standard oil operated type.

The Multi-pen Recorders and Associated Alarm Equipment [I2.1.8.5] are located in the Control Room of the Evaporator Building. There is a chart recorder for each DST farm in the Area. This recorder can be calibrated in place. ***This recorder is not connected to any computerized database, so record keeping requires that the recorder charts be stored/filed. This archival function should be automated.***

This design generally utilizes direct buried wire to connect the Analyzers (located in the Central Exhaust Station) to the Chart Recorders. The life expectancy of direct buried wire is unknown but its total life expectancy (present age plus future life) probably will not exceed 40 years.

I2.2 TANK ANNULUS VENTILATION SYSTEM

Tank Annulus Ventilation Instrumentation is all manual readout. Operation of this system is Operator Start/Stop. There is no automation.

I2.2.1 Annulus Differential Pressure Instrumentation is all manually read and ***is not connected to any computerized database, so record keeping requires that the Operator Rounds Sheets be stored/filed. Since the behavior and operation***

of this equipment is critical to operation of the Annulus Ventilation System, this archival function should be automated.

I3 TRANSFER LINE CONTROL SYSTEM

Control of the Waste Transfer Line Motive equipment and associated pipelines is mostly by manual operations. The Pump Control System [I3.1] is basically an Operator Start/Stop system that is permitted by circuitry associated with the Leak Detection System and the Master Pump Shutdown circuits. Line up of a Waste Transfer Route is executed by manual operation of pipeline valves. There is no electrical monitoring of valve position [I3.2] (AP Tank farm had some monitored but it has been taken out of service.) There are no motor or pneumatic operated waste transfer pipeline valves [I3.3]. There is no Waste Flow Monitoring Instrumentation although there is a flow monitor utilized in the Service Pit to monitor fresh water flow into the tank farm.

I3.4 PIPELINE PRESSURE SWITCHES monitor the primary containment of some pipelines in some tank farms. They are most generally found in process pits such as valve pits, service pits, etc. These switches are preset to actuate at a predetermined pressure. They are sometimes used to indicate the potential of flow. This sensed pressure may indicate a proper or improper valve lineup. If the pressure switch is on a pipeline that is blocked off of a waste transfer route, it may indicate valve leakage. *Pressure switches are not commonly installed on waste transfer pipelines.*

I3.5 WASTE FLOW MONITORING INSTRUMENTATION

In general, there is no Flow Monitoring Instrumentation on waste transfer pipelines in the DST farms.

I3.5.1 Service Pit Instrumentation

The Service Pit Instrumentation consists of a Flow Meter and Flow Totalizer, a Gamma Radiation Monitor and a Pipeline Pressure Gauge.

The Service Pit Flow Monitor & Totalizer [I3.5.1.1] is an instrument that provides poor resolution. *It requires a flow rate of at least 5 GPM before it will register any flow. Therefore, it cannot measure low flow rates. The signal output from this device is pulse oriented and requires special signal conditioning to make it compatible with a modern digital communications device.*

The Service Pit Gamma Radiation Monitor [I3.5.1.2] is a Hanford design. Availability of spare parts is poor.

I4 TANK CONTENTS MONITORING

The Tank Contents Monitoring System is comprised of several major instrument subsystems. They are systems are used to monitor the properties of the liquid waste and its vapors. They are the Waste - Vapor Space Temperature Probes, the Standard Hydrogen Monitoring System (SHMS), the Chemical Composition Monitoring Instrumentation, the Tank Liquid Surface Level Instrumentation and the Sludge Weight Monitoring Instrumentation.

I4.1 WASTE/VAPOR TEMPERATURE INSTRUMENTATION

There are several type of probes which are utilized to measure the temperature of the waste. Basically, they are all a long iron (or stainless steel) pipe with temperature sensors located periodically along its length. They are all immersed in the waste through a riser and reach near the bottom of the tank. Each DST has at least one temperature probe and some have more. Vapor monitoring is achieved by sampling the vapor space gas via a small tube and conducting this sample to an analyzer located outside of the tank. ***None of these trees will be able to withstand direct application of mixer pump forces without bending.***

I4.1.1 Thermocouple Probes [I4.1.1]

Four major design for thermocouple probes have been used at Hanford. Type "J" and "K" thermocouple have been incorporated. ***The oldest probes use type "J" thermocouples and the thermocouples are directly welded to the probe iron pipe. The thermocouples in these old probes are not replaceable and some have failed because of corrosion. These probes do not have a high probability of lasting the mission and should be replaced. Consideration should be given to replacing all the temperature probes that do not have replaceable temperature sensors.***

Newer temperature probe designs have incorporated several thimbles terminating at different locations inside the pipe. These allow the temperature sensors (typically type "K" thermocouples or PTDs) to be replaced. These probes do not have provisions for gas sampling ports.

I4.1.2 Multifunction Instrument Tree

The Multifunction Instrument Tree (MIT) incorporates both gas sampling ports and thermocouple temperature sensors. It is designed so that the response time of the temperature sensors is much faster than the old Thermocouple Probes (TP) or the new Temperature Vapor Probes (TVP). This temperature probe should have a long life expectancy.

14.1.3 Temperature Vapor Probe

The Temperature Vapor Probe is an update on the Thermocouple Probe and adds gas sampling ports. It utilizes thimbles so that the temperature sensor can be replaced. Both type "K" thermocouples and PTDs have been installed in these probes. The PTDs provide more resolution than the thermocouples. The temperature response time of this probe is not nearly as fast as the MIT but will be adequate for most tanks.

14.2 STANDARD HYDROGEN MONITORING SYSTEM

The Standard Hydrogen Monitoring System is a new system installed on "Watch List Tanks" to monitor for evolved hydrogen gas. It is only installed on about a third of the DST. This system is comprised of: gas flow & temperature instrumentation, a low range Hydrogen Concentration Detector, a high range Hydrogen concentration detector, and a multi-pen chart recorder.

14.3 CHEMICAL COMPOSITION MONITORING INSTRUMENTATION

Monitoring of the chemical composition of the tank waste is normally carried out by grab sample through a sampling riser. Some of the Tanks and the DCRTs have Specific Gravity Instrumentation installed which allows on-line analysis.

14.3.1 Tank Specific Gravity Instrumentation

The major components of this system is the Sample Tube (dip tube), which are located in a tank riser; the Specific Gravity Pressure Sensor and pneumatic converter, which are located in their Transmitter Enclosure (located near the tank riser); the Field Wiring, which is located underground in the tank farm; and the associated alarm indicators located on the Instrument Panel in the tank farm instrument building.

The Sample Tubes [14.3.1.1] tubes originate in the Transmitter Cabinet and proceed underground to the Pit and subsequently down the Leak Detection Pit Well to the Sump. Two tubes, each at a different level, are immersed in water maintained in the Leak Detection Pit Sump and the other is suspended in air in the

Well. Air is metered into the tubes at a constant flow rate and the differential pressure is measured between each of the immersed tubes and the air tube.

The Specific Gravity Pressure Sensors [4.3.1.2] measures the pressure across the two immersed tubes. This pressure varies because of changes in the level of liquid in the Tank or because the density of the liquid in the Tank has changed. These Pressure sensors are pneumatically operated and embody a pneumatic pressure transmitter. The output of the pressure transmitter is sent (instrument air signal) to the Pneumatic Converter. The output from the Pneumatic Converter is converted to an electrical signal and that electrical signal is sent to the tank farm Instrument Building via underground wiring.

The system basically can not be calibrated for the desired variable. Only the Pressure Sensor is calibrated and it is calibrated in units of pressure, not Specific Gravity.

Most of the farms utilize the Foxboro Pressure Transmitter. ***This Pressure Transmitter is based on a design that is almost 50 years old. Although there have been improvements to these Pressure Transmitters over the last few decades, it is unlikely that these devices will be manufactured much longer. Spare parts procurement is expected to become increasingly difficult.*** New technology, incorporating electronics, is commonly available from all Manufacturers.

The Transmitter Enclosure [4.3.1.3] contains not only the Pressure Sensor-Transmitters, but all the accessory instrumentation, tubing and valves necessary to make the Specific Gravity System work. In order to obtain the Specific Gravity data measurement for one tank, the following list of equipment is required:

TRANSMITTER ENCLOSURE

- 2 ea manual read air flow meters
- 1 ea pressure transmitters
- 5 ea manual read pressure gauges
- 4 ea manual adjust globe valve (tubing)
- 2 ea manual adjust globe valve (pipe)
- 1 ea pneumatic converter
- 1 ea pressure reducing station and manual read pressure gauge
- 1 lot of misc. tubing, fittings, manifolds, and an instrument frame

INSTRUMENT PANEL

- 1 ea Specific Gravity Indicators

The meters, gauges, pressure switches and indicators must be periodically calibrated. Calibration errors stack up in this type of system. Maintenance is exacerbated by the sheer number of components and the system requires a skilled maintenance worker to tune up. There are 4 SpG systems in service in the 6 DST farms.

I4.4 TANK LIQUID SURFACE LEVEL INSTRUMENTATION

There are several kinds of Tank Liquid Surface Level Instrumentation in use at Hanford. Some are manually operated and some are automatic. The oldest automatic reading type of gauge is the FIC pendulum/tape gauge. A new Enraf-Nonius radar gauge was installed on tank SY-101. It was determined that it was not acceptable for use for a replacement level gauge, although it is still in use for characterization activities. The new site standard replacement level gauge is the Enraf-Nonius (Model 854) Advanced Technology Gauge as recommended in Battelle Pacific Northwest Laboratory Technical Report PNL-8839.

I4.4.1 FIC Riser Extensions

These risers extensions provide a mount for the FIC gauge, a sight glass so that the plumb may be observed, a water washdown injection fogger nozzle (port), and a pressure port. *These riser extensions provide no means to isolate the device from the tank vapor space.*

I4.4.1(alt) Enraf Riser Extensions

These riser extensions are new and provide a mount for the new Enraf Buoyancy-tension gauge, a sight glass so that the displacer may be observed, a water washdown injection nozzle, a pressure sensing port and a ball valve, which is used to isolate the device from the tank vapor space during maintenance.

I4.4.2 FIC Level Sensor

This gauge provide liquid level measurement by lowering an electrically conductive tape with an electrically conductive probe (plumb) to the liquid surface and then sensing a current flow to detect the liquid level. The electrical circuit consists of the tape, plumb, liquid and the tank walls. The gauges keeps track of the distance the tape has been played out from the tape reel by electronic sensors. *This device is obsolete and is no longer manufactured. Spare parts are difficult to obtain.*

I4.4.2(alt) Enraf Buoyancy-Tension Level Sensor

This is a new gauge and is the preferred waste liquid level gauge for the TWRS mission. See Reference 11.

14.4.3 FIC Signal Cable

The old FIC Level Sensor were connected to its signal processing equipment by an underground cable. This cable is looped throughout a farm and in many cases it connects farms together. ***The life expectancy of this direct buried wire is unknown but its total life expectancy (present age plus future life) probably will not exceed 40 years.***

14.4.4 Enraf Signal Cable/Terminal Boxes

These are new and are installed in conduit.

14.4.5 CASS (FIC) Interface

The FIC Level Sensor signal processing equipment is located in tank farm Instrument Buildings. It connects to a CASS interface located in one of the CASS substations. ***These interfaces are specifically for the CASS and are obsolete.***

14.4.5(alt) Enraf Digital Interface

The Enraf Digital Interfaces are located in tank farm Instrument Buildings. They are new and connect to tank farm Enraf Liquid Level Gauges via underground conduit and wiring.

15 TANK CONTENTS MIXING SYSTEMS

Two type of mixing systems are used in the DST farms. The oldest is the Air Lift Circulators. The newest are the Mixing Pumps such as the one installed in tank SY-101 for Hydrogen mitigation. The PDRD does not address the need for either of these types of systems and this seems to be an omission.

15.1 AIR LIFT CIRCULATOR CONTROL SYSTEM

The Air Lift Circulator Control System is a manually operated system. Control is carried out by monitoring manually read Differential Pressure Sensors. ***The instruments are not connected to any computerized database, so record keeping requires that the Operator Rounds Sheets be stored/filed. Since the behavior and***

operation of this equipment is critical to operation of the Air Lift Circulator System, this archival function should be automated.

15.2 MIXING PUMP CONTROL SYSTEMS

Mixing pumps have been installed in a few of the DST. These pumps have electronic speed control and are equipped with an array of sensors to provide status and operational information to the operator.

16 SSC STATUS / MONITORING SYSTEM

Status monitoring of Systems, Structures and Components (SSC) is not centralized. Data is available on the PANALARM panel in the Instrument Building, in the tank farm on specific equipment panels (eg. HVAC system), and on individual instruments. Some alarm status information is available on the CASS system. Operators must run down a check list and determine the status of various equipment in order to make waste transfers. The SSC Status - Monitoring System (this system does not presently exist) is required for the following type of equipment/systems: the tank farm AC Power Supply System Status [I6.1], the tank farm Air Supply System Status [I6.2], the tank farm Water Supply System Status [I6.3], the tank Concrete Structures Temperature Instrumentation [I6.4], the Heat Trace System Status [I6.5], and the Cathodic Protection System Status [I6.6].

16.4 CONCRETE STRUCTURE TEMPERATURE INSTRUMENTATION

The DST all have a concrete envelope surrounding Secondary Containment tank. These envelope structures had many embedded thermocouple temperature sensors installed in them when they were fabricated. There is no way to calibrate the thermocouples. These temperature sensors are not replaceable. These temperature sensors can be monitored manually by an Operator. Many of the sensors were connected to data loggers when the CASS system was installed.

16.4.1 Temperature Data Loggers

Not evaluated at this time. (See the future CASS Assessment [C3.I].)

16.4.2 Manual Temperature Readout Control Panel

The manual readout for the temperature is located on the tank farm Instrument Building Instrument Panel. The design for this type of thermocouple readout is standard.

16.4.3 Thermocouple Wiring and Terminal Boxes

In most of the DST farms the Thermocouple extension wire is direct buried (AP tank farm is the exception). ***The life expectancy of direct buried thermocouple extension wire is unknown but its total life expectancy (present age plus future life) probably will not exceed 40 years.*** The Terminal boxes are a sealed junction box.

17 HEAT TRACE CONTROL SYSTEM

DST farms utilize heat trace heaters on some of the waste transfer piping and on other selected piping such as the water piping in the Service Pit or Flush Pit. Heat Trace Systems in use have the following major components: the Temperature Monitoring Sensors, located next to the pipe at selected locations; the Temperature Controller Subsystems, located on stands in the tank farm; the Heater Contactors, also located on stands in the tank farm; and the Pipeline Heat Trace Tape Heaters, located along the pipelines.

17.1 TEMPERATURE MONITORING SENSORS

The temperature sensors most commonly utilized are thermocouples, although RTDs are utilized at some locations. Most locations have three thermocouples installed, with one of these being a spare.

17.2(3) TEMPERATURE CONTROLLER SUBSYSTEMS

There can be two types of Temperature Controllers. These are the primary temperature controller and the over temperature controller. (Infrequently there is an under temperature controller.) These controller signal condition the thermocouple inputs and outputs an off/on signal to the Heater Contactors.

17.4 HEATER - CONTACTORS & OTHER WIRING

The Heater Contactors are actuated by 120 VAC control signals and are connected to either 240 VAC or 480 VAC power which is supplied to the pipeline heaters.

17.5 PIPELINE HEAT TRACE TAPE HEATERS

Heat Trace Heater are installed along selected pipelines in the DST. These are resistive wire heaters. ***These heaters are not easily maintainable because they are buried with the pipeline.***

18 CATHODIC PROTECTION CONTROL SYSTEM

Some pipelines have impressed current Cathodic Protection Systems installed along their length. These systems are very simple and consist of a current controller (rectifier) and the wiring to the pipeline.

18.1 POWER CONTROLLER

The Power controller is connected to the AC power supply and converts it to a DC power supply. These units are simple and basically have an on/off switch. some units have a current meter which is utilized to monitor current flow onto the pipeline impressed current circuit. ***There is no remote control or status monitoring capability for these units.***

18.2 SIGNAL WIRING

The life expectancy of this direct buried wire is unknown but its total life expectancy (present age plus future life) probably will not exceed 40 years.

Attachment 1.

W314B PROJECT VALIDATION FOR AW TANK FARM

(Don Bachand, July 5, 1995)

1. STACK

1.1 FLOW MEASUREMENT

1.1.1 FREQUENCY

C: The stack flow rate varies by more than 10%. Stack flow measurements are required to be taken frequently (40 CFR 61.93.b.1.iii), however, it is not possible/practical to schedule manual (Vent & Balance) stack flow measurements more frequently than quarterly/monthly. Certifiable (by 40 CFR 52, Appendix E) flow measuring equipment should be installed to correct this problem.

1.1.2 LOCATION

C: The stack flow rate is measured upstream of the sampling location, rather than downstream (40 CFR 61.93.b.1.ii; and 40 CFR 60, Appendix A, Method 1A). This compliance issue can be waived.

1.2 SAMPLING/MONITORING SYSTEM

1.2.1 PROBE

C: The sample probe nozzle lengths and bend radii are too small (40 CFR 61.93.b.2.ii; and ANSI N13.1, Appendix A, Figure A5).

1.2.2 SAMPLE LINES

R: The sample lines are relatively long, which contributes to the unacceptably low collection efficiency of the sampling system. Less than one percent of the large particles (10 micron) that enter the sample probe in the stack will reach the Record Sample or Continuous Air Monitor (CAM) filter paper (WHC-SD-WM-ES-291). This raises questions about the sampling/monitoring systems ability to collect/detect releases in the event of HEPA filter failure.

1.2.3 SAMPLING CONDITIONS

C: The sampling system does not maintain near-isokinetic sampling conditions (40 CFR 61.93.b.2.ii; and ANSI N13.1, Section 4.2.2.3). The stack flow rate varies by more than 10 percent, but the sample flow-rate does not automatically adjust to maintain near-isokinetic sampling conditions.

W314B PROJECT VALIDATION FOR AN TANK FARM

(Don Bachand, July 5, 1995)

1. STACK

1.1 FLOW MEASUREMENT

1.1.1 FREQUENCY

C: The stack flow rate varies by more than 10%. Stack flow measurements are required to be taken frequently (40 CFR 61.93.b.1.iii), however, it is not possible/practical to schedule manual (Vent & Balance) stack flow measurements more frequently than quarterly/monthly. Certifiable (by 40 CFR 52, Appendix E) flow measuring equipment should be installed to correct this problem.

1.1.2 LOCATION

C: The stack flow rate is measured upstream of the sampling location, rather than downstream (40 CFR 61.93.b.1.ii; and 40 CFR 60, Appendix A, Method 1A). This compliance issue can be waived.

1.2 SAMPLING/MONITORING SYSTEM

1.2.1 CABINET

1.2.1.1 SPACE

R: The existing cabinet is not large enough to house the gas meter. Consequently, the gasmeter is located outside of the cabinet, and is insulated and heat traced. The insulation and heat trace are required to prevent buildup of condensation, but make calibration/functional testing difficult.

1.2.1.2 LAYOUT

R: The existing cabinet layout severely inhibits the weekly replacement of filter paper in the Record Sample holder. The Record Sample holder is located approximately six feet above ground, and at the back of the cabinet. Radiological Control Technicians must stand on the lowest shelf in the cabinet in order to reach the Record Sample holder.

R: The existing sampling system contains a pressure switch for detecting problems in the sampling system (ie. sample pump failure, high filter paper loading). This switch should be replaced with a flow switch to be consistent with the other

sampling systems, and because flow is a more appropriate variable to use as indication of a problem.

- R: The pressure switch located in the existing cabinet is not accessible for calibration. Other instrumentation must be removed from the cabinet in order to gain access to the pressure switch.

W314B PROJECT VALIDATION FOR AN TANK FARM - CONTINUED

- R: The existing cabinet lacks an adequate amount of clearance around the CAM to disconnect/connect electrical power, control wires, and sample tubes, which make annual calibration of the CAM difficult and unsafe.

1.2.2 PROBE

- C: The sample probe nozzle lengths and bend radii are too small (40 CFR 61.93.b.2.ii; and ANSI N13.1, Appendix A, Figure A5).

1.2.3 SAMPLE LINES

- R: The sampling system has an unacceptably low collection efficiency. Less than one percent of the large particles (10 micron) that enter the sample probe in the stack will reach the Record Sample or Continuous Air Monitor (CAM) filter paper (WHC-SD-WM-ES-291). This raises questions about the sampling/monitoring systems ability to collect/detect releases in the event of HEPA filter failure.

1.2.4 SAMPLING CONDITIONS

- C: The sampling system does not maintain near-isokinetic sampling conditions (40 CFR 61.93.b.2.ii; and ANSI N13.1, Section 4.2.2.3). The stack flow rate varies by more than 10 percent, but the sample flow-rate does not automatically adjust to maintain near-isokinetic sampling conditions.

W314B PROJECT VALIDATION FOR AP TANK FARM

(Don Bachand, September 26, 1995)

1.0 PRIMARY STACK (296-A-40)

The 296-A-40 stack sampling system and a portion of the stack are being replaced in FY96. The upgraded stack and sampling system will be in compliance with National Emission Standards for Hazardous Air Pollutants (NESHAP, 40 CFR 61) and other referenced requirements. After the stack and sampling system have been upgraded, the following deficiencies will no longer exist.

1.1 FLOW MEASUREMENT

1.1.1 FREQUENCY

C: The stack flow rate varies by more than 10%. Stack flow measurements are required to be taken frequently (40 CFR 61.93.b.1.iii), however, it is not possible/practical to schedule manual (Vent & Balance) stack flow measurements more frequently than quarterly/monthly. Certifiable (by 40 CFR 52, Appendix E) flow measuring equipment should be installed to correct this problem.

1.1.2 LOCATION

C: The stack flow rate is measured two duct diameters downstream of the sampling probe and zero duct diameters upstream of the top of the stack. This flow measurement location does not meet the alternate criteria of two duct diameters downstream from and two and one half duct diameters upstream of the nearest flow disturbances (40 CFR 60, Appendix A, Method 1A, Paragraph 2.1.1).

1.2 SAMPLING/MONITORING SYSTEM

1.2.1 SAMPLING CONDITIONS

C: The sampling system does not maintain near-isokinetic sampling conditions (40 CFR 61.93.b.2.ii; and ANSI N13.1, Section 4.2.2.3). The stack flow rate varies by more than 10 percent, but the sample flow-rate does not automatically adjust to maintain near-isokinetic sampling conditions.

2.0 ANNULUS STACK (296-A-41)

There are no environmental requirements associated with the annulus stack and stack sampling system at this time. However, should a leak occur in

one of the double-shell tanks, the same requirements that apply to the primary stack (296-A-40) would apply to the annulus stack.

W314B PROJECT VALIDATION FOR SY TANK FARM

(Don Bachand, September 26, 1995)

1.0 PRIMARY STACK (296-S-25)

This new stack is scheduled to come on-line in the near future, replacing the 296-P-23 Stack as the primary exhaustor/stack for the SY Tank Farm. The 296-S-25 Stack is in compliance with National Emission Standards for Hazardous Air Pollutants (NESHAP, 40 CFR 61) and other referenced requirements.

Furthermore, the potential offsite dose from this stack has been reevaluated and determined to be less than 0.1 mrem/year (0.1 mrem/year being the threshold above which NESHAP requirements apply). The reevaluation has been submitted to the Environmental Protection Agency (EPA) for their review and concurrence (which is expected).

2.0 BACKUP STACK (296-P-23)

The potential offsite dose from this stack has been reevaluated and determined to be less than 0.1 mrem/year (0.1 mrem/year being the threshold above which NESHAP requirements apply). The reevaluation has been submitted to the Environmental Protection Agency (EPA) for their review and concurrence (which is expected). Upon receipt of EPA's concurrence, the 296-P-23 Stack will be in compliance with the requirements for radioactive air emissions, and the following deficiencies will no longer exist.

2.1 FLOW MEASUREMENT

2.1.1 FREQUENCY

C: The stack flow rate varies by more than 10%. Stack flow measurements are required to be taken frequently (40 CFR 61.93.b.1.iii), however, it is not possible/practical to schedule manual (Vent & Balance) stack flow measurements more frequently than quarterly/monthly. Certifiable (by 40 CFR 52, Appendix E) flow measuring equipment should be installed to correct this problem.

2.1.2 LOCATION

C: The stack flow rate is measured upstream of the sampling location, rather than downstream (40 CFR 61.93.b.1.ii; and 40 CFR 60, Appendix A, Method 1A). This compliance issue is minor and can likely be waived.

2.2 SAMPLING/MONITORING SYSTEM

2.2.1 SAMPLING CONDITIONS

- C: The sampling system does not maintain near-isokinetic sampling conditions (40 CFR 61.93.b.2.ii; and ANSI N13.1, Section 4.2.2.3). The stack flow rate varies by more than 10 percent, but the sample flow-rate does not automatically adjust to maintain near-isokinetic sampling conditions.

3.0 ANNULUS STACK (296-P-22)

There are no environmental requirements associated with the annulus stack and stack sampling system at this time. However, should a leak occur in one of the double-shell tanks, the same requirements that apply to the primary stack would apply to the annulus stack.

W314B PROJECT VALIDATION FOR AY/AZ TANK FARM ANNULUS

(Don Bachand, September 26, 1995)

1.0 AY ANNULUS STACKS (296-A-18, 296-A-19) AND AZ ANNULUS STACK (296-A-20)

There are no environmental requirements associated with the annulus stack and stack sampling system at this time. However, should a leak occur in one of the double-shell tanks, the same requirements that apply to the primary stack (296-A-17) would apply to the annulus stack.

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14.0 REFERENCES

- (1) WHC-SD-EN-EU-006 Revision 0, "Tank Spill and Overflow Prevention and Leak Detection."
- (2) WHC-SD-WM-CR-058, Revision 0, "Gaseous Effluent Monitoring System Design Criteria."
- (3) WHC-EP-0728, "Ferrocyanide Safety Program: Data Requirements for the Ferrocyanide Safety Issue Developed Through the Data Quality Objectives (DQO) Process."
- (4) PNL-8839/AC-606, "Evaluation of Methods to Measure Surface Level in Waste Storage Tank: Second Test Sequence," September 1993.
- (5) WHC-EP-0758, Revision 0, "Criteria for Temperature Monitoring in Ferrocyanide Waste Tank at the Hanford Site."
- (6) WHC-SD-WM-PLN-018, Revision 0, "Data Management Plan for Tank 241-SY-101, Monitoring System."
- (7) WHC-SD-WM-ER-115, Revision 0, "Results of Gamma Flux Measurement in 241-SY-101."
- (8) WHC-SD-WM-DB-004, Revision 0, "101-SY Hydrogen Monitoring System Requirements."
- (9) SU-WM-TI-357, "Waste Storage Tank Status and Leak Detection Criteria."
- (10) Internal Memo, from D. M. Bogen to , "Electrical, Instrumentation, and Control Upgrade Plan," dated April 15, 1991.
- (11) WHC-SP-WM-P-589, Revision 0, "Waste Storage Tank Level Detector Replacement Report."
- (12) Minutes, "Tank Instrumentation Assistance Panel (ITAP), August 23-24, 1994," Richland, Washington.
- (13) WHC-SD-WM-TP-282, Revision 0, "Test Plan for Tank AN-107 Mixing and Caustic Addition."
- (14) WHC-SD-EMP-031, Revision 0A, "Determination of the NESHAP Status of Tank Farms Stacks Based on Calculations Using 40 CFR, Part 60, Appendix D Factors."

WHC-SD-W314-ES-018, Rev 0

- (15) TF-04-WST-01-D, TO-040-540, TF-0A-WST-02, TO-040-200, Various Operator Rounds Sheets.
- (16) SD-WM-ES-089, Revision 0, "Computer Automated Surveillance System Upgrade."
- (17) WHC-EP-0392, "Tank Farm Upgrades Program Plan," June 1991.
- (18) WHC-SD-WM-ER-089, Revision 0, "241-SY-101 Tank Pressure Monitoring Instrumentation."
- (19) WHC-SD-WM-SAR-016, Revision 1, "Double Shell Tank Farm Facility Safety Analysis Report."
- (20) WHC-SD-WM-ETP-153, Revision 0, "Double Shell Tank Waste System Assessment Status and Schedule."
- (21) WHC-SD-WM-WP-132, Revision 0 through Revision 5, "Tank Farm Instrumentation Upgrade Plan."
- (22) WHC-SD-HS-SAR-010, "Aging Waste Facility Safety Analysis Report."
- (23) ECN 612684, "Safety Basis Implementation," September 29, 1994.
- (24) TO-040-590, Tank Farm Plant Operating Procedure, FF-OR-A-03, Tank Farm Plant Operating Procedure.
- (25) WHC-SD-WM-TI-553, "Thermocouple Status Single Shell and Double Shell Waste Tanks."
- (26) Internal Memo (33610-94-JEK-004), J. E. Kane to F.T. Clifton, "CAMs Approved for Use at Hanford."
- (27) WHC-SD-WM-EV-094, Rev 0, "
- (28) WHC-SD-WM-ES-176, "Hydrogen Ignition Capability of Tank Farm Instrumentation and Electrical Equipment, WHC
- (29) WHC-SD-WM-ES-362, Rev 0, " Tank Farm Potential Ignition Sources."
- (30) WHC-SD-WM-TI-671, Rev 0, "TMACS SYSTEM DESCRIPTION."

15.0 APPENDIX 1

CONDITION ASSESSMENT INFORMATION SYSTEM

Report : COMPLETE SURVEY DETAIL

Filename : RPTCSD.lis

Run by : CAIS12

Report Date : 16-NOV-1995 07:28

Parameters Entered

Survey Asset ID : 241AN%

Survey Asset ID Suffix: %

Inspector ID : GMG

Survey Type : %

Survey Version : %

Discipline : %

WHC-SD-W314-ES-018, Rev 0

16-NOV-95
14

CONDITION ASSESSMENT INFORMATION SYSTEM

Page 1 of

Westinghouse Hanford Co.

COMPLETE SURVEY DETAIL

Area : 13050 HANFORD

Site Asset: 241AN-0000 UNDRGRND WASTE STOR TANK FARM UNDRGRND WASTE

Survey Asset : 241AN-0000 UNDRGRND WASTE STOR TANK FARM UNDRGRND WASTE
Asset Class : BUILDINGS;GENERAL Use Code: Nuclear Contaminated ADF : FULL CAS

Inspector : GILMOUR, GARY

Discipline : Electrical

Survey Date : 24-MAY-95

Survey Time: 10:45:46

Survey Type: CAS

Survey Version : 95-FY

Insp-CAIS Software Version: 1.200

WBS : Mech;Heat + Vent;Hot Air Furnaces

Location: 1 Asset - Wide

Component : MECH;EQUIPMENT CONTROLS + PANELS

Location: 1 K2-5-1 & 5-2 BLAST HTR CONTROL

Type : Humidistat;Electric

Humidistat;Electric

Floor :

Room: EXT

Equipment ID :

Q'ty at Location: 2 EACH

Estimated Cost : 0

Replacement Q'ty: 0 EACH

Year Installed : 1980

Year of Last Insp.: 0

Life w/ Repair : 10

Life w/o Repair : 2

Urgency : REPAIR IN 1-2 YEARS

Condition: FAIR <25%

Imp'tce : PRIMARY

Status :

Service : CONTINUOUS

Access :

Rep.Task:

Rep.Cause:

Rep.Sympt:

Purpose

MAINTENANCE

Survey IU Comments

Comment Types

Note Log : K2-5-1 & 5-2 BLAST HEATER CONTROL UNITS SURVEY INFO

Photo Log : NEED TO BE CLEANED AND INTERNAL WIRE

Sketch Log: TERMINATIONS WITH OBVIOUS CORROSION

NEED TO BE CLEANED, POSSIBLY NEW RING

LUGS APPLIED AND RETERMINATED.

Note Log :

Photo Log :

Sketch Log:

Note Log :

Photo Log :

Sketch Log:

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Sketch Log:

16-NOV-95
14

CONDITION ASSESSMENT INFORMATION SYSTEM

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Westinghouse Hanford Co.

COMPLETE SURVEY DETAIL

Note Log :
Photo Log :
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Note Log :
Photo Log :
Sketch Log:

Deficiency Group	Deficiency	Coverage (%)			
		Light	Moderate	Severe	Fail NSIP
N	MECH;EQUIPMENT CONTROLS + PANELS	HOUSING: CORROSION, PHYSICAL DAMAGE			80
	Etc.				
	MECH;EQUIPMENT CONTROLS + PANELS	WIRING: DAMAGED, LOOSE			40
	Etc.				N

WBS : Elec;Serv +Distrib;Low Voltage Distrib Location: 1 Asset - Wide

Component : ELEC;RACEWAYS,FITTINGS Location: 1 K2-5-2 FLEX FOR PRESS.DIFF.SWS
Type : CONDUIT; FLEX; SEALTITE; 3/4" AND SMALL CONDUIT; FLEX; SEALTITE; 3/4" AND SMALL

Floor : Room: EXT Equipment ID :
Q'ty at Location: 9 LNFT Estimated Cost : 0
Replacement Q'ty: 0 LNFT

Year Installed : 1980 Year of Last Insp.: 0 Life w/ Repair : 10 Life w/o Repair : 2

Urgency : REPAIR WITHIN 1 YEAR Condition: FAIR <25% Imp'tce : PRIMARY
Status : Service : CONTINUOUS Access :
Rep.Task: Rep.Cause: Rep.Sympt:

Purpose
MAINTENANCE

16-NOV-95
14

CONDITION ASSESSMENT INFORMATION SYSTEM

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Westinghouse Hanford Co.

COMPLETE SURVEY DETAIL

Deficiency Group	Deficiency	Coverage (%)		
		Light Moderate Severe Fail NSIP		
ELEC;RACEWAYS,FITTINGS,DEVICES	RACEWAY: IMPROPER FOR APPLICATION, CORRODED, PHYSICAL DAMAGE Etc.		50	N

Component : ELEC;RACEWAYS,FITTINGS Location: 2 FLEX CONDUIT TO VANE DR. MOTOR
 Type : CONDUIT; FLEX; SEALTITE; 3/4" AND SMALL CONDUIT; FLEX; SEALTITE; 3/4" AND SMALL

Floor : Room: EXT Equipment ID :
 Q'ty at Location: 8 LNFT Estimated Cost : 0
 Replacement Q'ty: 0 LNFT

Year Installed : 1980 Year of Last Insp.: 0 Life w/ Repair : 10 Life w/o Repair : 2

Urgency : REPAIR IN 1-2 YEARS Condition: FAIR <25% Imp'tce : PRIMARY
 Status : Service : CONTINUOUS Access :
 Rep.Task: Rep.Cause: Rep.Sympt:

Purpose
 MAINTENANCE

Deficiency Group	Deficiency	Coverage (%)		
		Light Moderate Severe Fail NSIP		
ELEC;RACEWAYS,FITTINGS,DEVICES	RACEWAY: IMPROPER FOR APPLICATION, CORRODED, PHYSICAL DAMAGE Etc.		30	N

Component : ELEC;WIRES,CABLES,FITTINGS Location: 1 MCC-241-AN CUBICLE C-7
 Type : CONDUCTOR; #14 TO #12 AWG; 600 V CONDUCTOR; #14 TO #12 AWG; 600 V

Floor : Room: FARM Equipment ID :
 Q'ty at Location: 1 LNFT Estimated Cost : 0
 Replacement Q'ty: 0 LNFT

Year Installed : 0 Year of Last Insp.: 0 Life w/ Repair : 10 Life w/o Repair : 3

Urgency : REPAIR WITHIN 1 YEAR Condition: POOR <60% Imp'tce : PRIMARY
 Status : Service : CONTINUOUS Access :
 Rep.Task: Rep.Cause: Rep.Sympt:

Purpose
 MAINTENANCE

Survey IU Comments	Comment Types
Note Log : DUE TO TERMINAL BLOCK STACKING IN THE	SURVEY INFO
Photo Log : WIREWAYS, AND THE NEED TO MOVE THOSE AT	
Sketch Log: THE TOP FRONT TO GET TO THOSE IN THE	
BACK, SOLID WIRE WILL BREAK.	

Westinghouse Hanford Co.

COMPLETE SURVEY DETAIL

[illegible]

Deficiency

Group

Deficiency

Coverage (%)

Light Moderate Severe Fail NSIP

ELEC; WIRES, CABLES, FITTINGS

CABLE, CONDUCTOR: IMPROPER, UNDER-RATED,

N

100

NOT MARKED, BURNED, DAMAGED Etc.

16-NOV-95

CONDITION ASSESSMENT INFORMATION SYSTEM

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14

Westinghouse Hanford Co.

COMPLETE SURVEY DETAIL

Component : ELEC;WIRES,CABLES,FITTINGS Location: 2 THROUGHOUT THE "AN" FARM
 Type : CONDUCTOR; #14 TO #12 AWG; 600 V CONDUCTOR; #14 TO #12 AWG; 600 V

Floor : Room: FARM Equipment ID :
 Q'ty at Location: 100 LNFT Estimated Cost : 0
 Replacement Q'ty: 0 LNFT

Year Installed : 0 Year of Last Insp.: 0 Life w/ Repair : 10 Life w/o Repair : 0

Urgency : REPAIR IMMEDIATELY Condition: FAIL <100% Imp'tce : PRIMARY
 Status : Service : CONTINUOUS Access :
 Rep.Task: Rep.Cause: Rep.Sympt:

Purpose
 H&S: IMMINENT HAZ
 CODE VIOLATION

Survey IU Comments Comment Types
 Note Log : BONDING JUMPERS THROUGHOUT THE FARM SURVEY INFO
 Photo Log : LAID ON TOP OF THE GROUND ARE A VIOLATIO
 Sketch Log: N OF THE NEC AND ARE NOT IN
 COMPLIANCE WITH OSHA REGULATIONS. THEY
 POSE A SERIOUS TRIPPING HAZARD TO
 PERSONNEL.

Note Log :
 Photo Log :
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16-NOV-95
14

CONDITION ASSESSMENT INFORMATION SYSTEM

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Westinghouse Hanford Co.

COMPLETE SURVEY DETAIL

Note Log :
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Photo Log :
Sketch Log:

Deficiency Group	Deficiency	Coverage (%)	
		Light Moderate Severe Fail NSIP	
ELEC;WIRES,CABLES,FITTINGS	INSTALLATION: IMPROPER; CONDUCTORS NOT ISOLATED, MARKED, JOINED; LOOSE Etc.		100 N

Component : ELEC;DISCONNECT Location: 1 241-AN-US SUBSTATION
Type : CKT BKR; 600V;1000-1200A; NE 1 CKT BKR; 600V;1000-1200A; NE 1

Floor : Room: Equipment ID :
Q'ty at Location: 1 EACH Estimated Cost : 0
Replacement Q'ty: 0 EACH

Year Installed : 1978 Year of Last Insp.: 0 Life w/ Repair : 10 Life w/o Repair : 2

Urgency : REPAIR IMMEDIATELY Condition: FAIL <100% Imp'tce : PRIMARY
Status : Service : CONTINUOUS Access :
Rep.Task: Rep.Cause: Rep.Sympt:

Purpose
MAINTENANCE

Survey IU Comments	Comment Types
Note Log : BREAKER F8X402 LOCATED AT 241-AN-US	SURVEY INFO
Photo Log : SUBSTATION IS THE SINGLE FEED TO MOTOR	
Sketch Log: CONTROL CNTR. EDS-MCC-101 AT 241-AN-271.	
THIS BREAKER HAS NOT BEEN SUBJECTED TO MAINTENANCE STANDARDS TESTING. LOSS OF THIS BREAKER (no spare available) WILL LEAVE AN FARM WITHOUT POWER.	

Note Log :
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Sketch Log:
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Photo Log :
Sketch Log:
Note Log :
Photo Log :
Sketch Log:

16-NOV-95
14

CONDITION ASSESSMENT INFORMATION SYSTEM

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Westinghouse Hanford Co.

COMPLETE SURVEY DETAIL

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Deficiency Group	Deficiency	Coverage (%)	Light	Moderate	Severe	Fail	NSIP
ELEC;DISCONNECT	PROTECTIVE RELAY: IMPROPER, DAMAGED, MISCALIBRATED, FAULTY INSTALLATION Etc.						100 N

Component : ELEC;MOTOR CONTROL CENTER;(ASSY) Location: 1 MCC-241-AN
Type : MCC;INCOM;3VERTSECT;15-25KVA XFM;NE1-12 MCC;INCOM;3VERTSECT;15-25KVA XFM;NE1-12

Floor : Room: Equipment ID :
Q'ty at Location: 1 EACH Estimated Cost : 0
Replacement Q'ty: 0 EACH

Year Installed : 1978 Year of Last Insp.: 0 Life w/ Repair : 15 Life w/o Repair : 0

Urgency : REPAIR IMMEDIATELY Condition: FAIL <100% Imp'tce : PRIMARY
Status : Service : CONTINUOUS Access :
Rep.Task: Rep.Cause: Rep.Sympt:

Purpose
MAINTENANCE

16-NOV-95
14

CONDITION ASSESSMENT INFORMATION SYSTEM

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Westinghouse Hanford Co.

COMPLETE SURVEY DETAIL

Component : ELEC;MOTOR CONTROL CENTER;(ASSY) Location: 2 WIREWAY CUBICLE B-6
 Type : MCC;INCOM;3VERTSECT;15-25KVA XFM;NE1-12 MCC;INCOM;3VERTSECT;15-25KVA XFM;NE1-12

Floor : Room: FARM Equipment ID :
 Q'ty at Location: 1 EACH Estimated Cost : 0
 Replacement Q'ty: 0 EACH

Year Installed : 0 Year of Last Insp.: 0 Life w/ Repair : 10 Life w/o Repair : 1

Urgency : REPAIR IMMEDIATELY Condition: FAIR <25% Imp'tce : PRIMARY
 Status : Service : CONTINUOUS Access :
 Rep.Task: Rep.Cause: Rep.Sympt:

Purpose
 MAINTENANCE

Deficiency Group	Deficiency	Coverage (%)	Light	Moderate	Severe	Fail	NSIP
ELEC;GROUNDING	TERMINATION LOOSE, IMPROPER, OR INADEQUATE.					50	N

Component : ELEC;MOTOR CONTROL CENTER;(ASSY) Location: 3 CLEAN MCC-241-AN THROUGHOUT
 Type : MCC;INCOM;3VERTSECT;15-25KVA XFM;NE1-12 MCC;INCOM;3VERTSECT;15-25KVA XFM;NE1-12

Floor : Room: FARM Equipment ID :
 Q'ty at Location: 1 EACH Estimated Cost : 0
 Replacement Q'ty: 0 EACH

Year Installed : 0 Year of Last Insp.: 0 Life w/ Repair : 4 Life w/o Repair : 2

Urgency : REPAIR IMMEDIATELY Condition: POOR <60% Imp'tce : PRIMARY
 Status : Service : CONTINUOUS Access :
 Rep.Task: Rep.Cause: Rep.Sympt:

Purpose
 MAINTENANCE

Deficiency Group	Deficiency	Coverage (%)	Light	Moderate	Severe	Fail	NSIP
ELEC;MOTOR CONTROL CENTER;(ASSY)	ENCLOSURE: IMPROPER, CORRODED, NOT SE-					50	N

CURED, PHYSICALLY DAMAGED Etc.

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CONDITION ASSESSMENT INFORMATION SYSTEM

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COMPLETE SURVEY DETAIL

Component : ELEC;MOTOR CONTROL CENTER;(ASSY) Location: 1 OL RESET ACTUATORS REMOVED
Type : COMB DISC &STAR;W/ENC;600V;SZ 00; NE 1 COMB DISC &STAR;W/ENC;600V;SZ 00; NE 1

Floor : Room: MCC Equipment ID :
Q'ty at Location: 2 EACH Estimated Cost : 0
Replacement Q'ty: 0 EACH

Year Installed : 0 Year of Last Insp.: 0 Life w/ Repair : 5 Life w/o Repair : 5

Urgency : REPAIR WITHIN 1 YEAR Condition: POOR <60% Imp'tce : PRIMARY
Status : Service : CONTINUOUS Access :
Rep.Task: Rep.Cause: Rep.Sympt:

Purpose
MAINTENANCE

Deficiency Group	Deficiency	Coverage (%)	
		Light Moderate Severe Fail NSIP	
ELEC;MOTOR CONTROL CENTER;(ASSY)	DISCONNECT: IMPROPER, PHYSICALLY DAMAGED		80
N	INACCESSIBLE, UNPROTECTED Etc.		

Component : ELEC;MOTOR CONTROL CENTER;(ASSY) Location: 1 MCC-241-AN CUBICLES B-3 & B-4
Type : DISC + START;W/ENCL;600V;SZ 1;3PH; NE 1 DISC + START;W/ENCL;600V;SZ 1;3PH; NE 1

Floor : Room: EXT Equipment ID :
Q'ty at Location: 1 EACH Estimated Cost : 0
Replacement Q'ty: 0 EACH

Year Installed : 0 Year of Last Insp.: 0 Life w/ Repair : 10 Life w/o Repair : 3

Urgency : REPAIR IMMEDIATELY Condition: ADQT <10% Imp'tce : PRIMARY
Status : Service : CONTINUOUS Access :
Rep.Task: Rep.Cause: Rep.Sympt:

Purpose
MAINTENANCE

Deficiency Group	Deficiency	Coverage (%)	
		Light Moderate Severe Fail NSIP	
ELEC;MOTOR CONTROL CENTER;(ASSY)	ENCLOSURE: IMPROPER, CORRODED, NOT SE-		70
N	CURED, PHYSICALLY DAMAGED Etc.		

WBS : Elec;Spcl;Heating,Baseboard Radiation Location: 1 Asset - Wide

Survey Asset : 241AN-0000 UNDRGRND WASTE STOR TANK FARM UNDRGRND WASTE
Asset Class : BUILDINGS;GENERAL Use Code: Nuclear Contaminated ADF : FULL CAS

Inspector : GILMOUR, GARY Discipline : Electrical

Survey Date : 02-AUG-95 Survey Time: 10:15:56 Survey Type: CAS
Survey Version : 95-FY Insp-CAIS Software Version: 1.200

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CONDITION ASSESSMENT INFORMATION SYSTEM

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COMPLETE SURVEY DETAIL

WBS : Elec;Serv + Distrib;Low Voltage Distrib Location: 1 Asset - Wide

Component : ELEC;RACEWAYS,FITTINGS
Type : PULL/JUNCTION BOX; 24X24X8Location: 1 JBX-A SE CORNER OF FARM
PULL/JUNCTION BOX; 24X24X8Floor : Room: Equipment ID :
Q'ty at Location: 1 LNFT Estimated Cost : 0
Replacement Q'ty: 0 LNFT

Year Installed : 1980 Year of Last Insp.: 0 Life w/ Repair : Life w/o Repair : 1

Urgency : REPAIR IMMEDIATELY Condition: FAIL <100% Imp'tce : PRIMARY
Status : Service : CONTINUOUS Access :
Rep.Task: Rep.Cause: Rep.Sympt:Purpose
CODE VIOLATION
MAINTENANCE

Deficiency Group	Deficiency	Coverage (%)	Light	Moderate	Severe	Fail	NSIP
ELEC;RACEWAYS,FITTINGS,DEVICES	FITTINGS/DEVICES: IMPROPER, BROKEN, MISSING, Etc.						
						100	N

Component : ELEC;RACEWAYS,FITTINGS
Type : PULL/JUNCTION BOX; 36X36X8Location: 1 TRANS PNL 101/ PIT AN-01C
PULL/JUNCTION BOX; 36X36X8Floor : Room: Equipment ID :
Q'ty at Location: 1 LNFT Estimated Cost : 0
Replacement Q'ty: 0 LNFT

Year Installed : 1980 Year of Last Insp.: 0 Life w/ Repair : 15 Life w/o Repair : 3

Urgency : REPAIR IN 1-2 YEARS Condition: POOR <60% Imp'tce : PRIMARY
Status : Service : CONTINUOUS Access :
Rep.Task: Rep.Cause: Rep.Sympt:Purpose
MAINTENANCE

Survey IU Comments	Comment Types
Note Log : DOOR SEALS ARE ROTTED	SURVEY INFO
Photo Log :	
Sketch Log:	

Deficiency Group	Deficiency	Coverage (%)	Light	Moderate	Severe	Fail	NSIP

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COMPLETE SURVEY DETAIL

ELEC;RACEWAYS,FITTINGS,DEVICES
MISSING, Etc.

FITTINGS/DEVICES: IMPROPER, BROKEN,

80 N

Component : ELEC;RACEWAYS,FITTINGS
Type : PULL/JUNCTION BOX; 36X36X8Location: 2 VTA-PNL-103 OUTLET CAM
PULL/JUNCTION BOX; 36X36X8Floor : Room: Equipment ID :
Q'ty at Location: 1 LNFT Estimated Cost : 0
Replacement Q'ty: 0 LNFT

Year Installed : 0 Year of Last Insp.: 0 Life w/ Repair : 20 Life w/o Repair : 4

Urgency : REPAIR IN 1-2 YEARS Condition: POOR < 60% Imp'tce : PRIMARY
Status : Service : CONTINUOUS Access :
Rep.Task: Rep.Cause: Rep.Sympt:Purpose
CODE VIOLATION
MAINTENANCESurvey IU Comments Comment Types
Note Log : A CONDUIT "T" IS AT THE BOTTOM OF THE EN SURVEY INFO
Photo Log : CLOSURE WITH ITS COVER MISSING AND A FIT
Sketch Log : TING AT ONE END WHICH SUPPORTS A MULTI C
ONDUCTOR CABLE IS MISSING.Deficiency Group Deficiency Coverage (%)
ELEC;RACEWAYS,FITTINGS,DEVICES FITTINGS/DEVICES: IMPROPER, BROKEN, 90 N
MISSING, Etc.Component : ELEC;PANELBOARDS Location: 1 HEAT TRACE PNL W OF PIT AN-a
Type : PANELBOARD; 120V; 15-99A;1-3POLE PANELBOARD; 120V; 15-99A;1-3POLEFloor : Room: Equipment ID :
Q'ty at Location: 1 EACH Estimated Cost : 0
Replacement Q'ty: 0 EACH

Year Installed : 1980 Year of Last Insp.: 0 Life w/ Repair : Life w/o Repair : 5

Urgency : REPAIR IN 1-2 YEARS Condition: FAIR < 25% Imp'tce : PRIMARY
Status : Service : CONTINUOUS Access :
Rep.Task: Rep.Cause: Rep.Sympt:Purpose
MAINTENANCE

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CONDITION ASSESSMENT INFORMATION SYSTEM

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COMPLETE SURVEY DETAIL

Survey IU Comments

Comment Types

Note Log : DIRECTORY UPDATE NEEDED.

SURVEY INFO

Photo Log :

Sketch Log:

Deficiency

Coverage (%)

Group

Deficiency

Light Moderate Severe Fail NSIP

ELEC;PANELBOARDS;(ASSY)

MARKING: IMPROPER, MISSING, ILLEGIBLE

100 N

Etc.

CONDITION ASSESSMENT INFORMATION SYSTEM

Report : COMPLETE SURVEY DETAIL

Filename : RPTCSD.lis

Run by : CAIS12

Report Date : 16-NOV-1995 07:36

Parameters Entered

Survey Asset ID : 241AN%

Survey Asset ID Suffix: %

Inspector ID : GMG

Survey Type : %

Survey Version : %

Discipline : %

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CONDITION ASSESSMENT INFORMATION SYSTEM

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Westinghouse Hanford Co.

COMPLETE SURVEY DETAIL

Area : 13050 HANFORD

Site Asset: 241AN-0000 UNDRGRND WASTE STOR TANK FARM UNDRGRND WASTE

Survey Asset : 241AN-0000 UNDRGRND WASTE STOR TANK FARM UNDRGRND WASTE
Asset Class : BUILDINGS;GENERAL Use Code: Nuclear Contaminated ADF : FULL CAS

Inspector : GILMOUR, GARY Discipline : Electrical

Survey Date : 24-MAY-95 Survey Time: 10:45:46 Survey Type: CAS
Survey Version : 95-FY Insp-CAIS Software Version: 1.200

WBS : Mech;Heat + Vent;Hot Air Furnaces Location: 1 Asset - Wide

Component : MECH;EQUIPMENT CONTROLS + PANELS Location: 1 K2-5-1 & 5-2 BLAST HTR CONTROL
Type : Humidistat;Electric Humidistat;Electric

Floor : Room: EXT Equipment ID :
Q'ty at Location: 2 EACH Estimated Cost : 0
Replacement Q'ty: 0 EACH

Year Installed : 1980 Year of Last Insp.: 0 Life w/ Repair : 10 Life w/o Repair : 2

Urgency : REPAIR IN 1-2 YEARS Condition: FAIR < 25% Imp'tce : PRIMARY
Status : Service : CONTINUOUS Access :
Rep.Task: Rep.Cause: Rep.Sympt:

Purpose
MAINTENANCE

Survey IU Comments Comment Types
Note Log : K2-5-1 & 5-2 BLAST HEATER CONTROL UNITS SURVEY INFO
Photo Log : NEED TO BE CLEANED AND INTERNAL WIRE
Sketch Log: TERMINATIONS WITH OBVIOUS CORROSION
NEED TO BE CLEANED, POSSIBLY NEW RING
LUGS APPLIED AND RETERMINATED.

Note Log :
Photo Log :
Sketch Log:
Note Log :
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CONDITION ASSESSMENT INFORMATION SYSTEM

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COMPLETE SURVEY DETAIL

Note Log :
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N	Deficiency Group	Deficiency	Coverage (%)				
			Light	Moderate	Severe	Fail NSIP	
	MECH;EQUIPMENT CONTROLS + PANELS	HOUSING: CORROSION, PHYSICAL DAMAGE					80
		Etc.					
	MECH;EQUIPMENT CONTROLS + PANELS	WIRING: DAMAGED, LOOSE				40	N
		Etc.					

WBS : Elec;Serv + Distrib;Low Voltage Distrib Location: 1 Asset - Wide

Component : ELEC;RACEWAYS,FITTINGS Location: 1 K2-5-2 FLEX FOR PRESS.DIFF.SWS
Type : CONDUIT; FLEX; SEALTITE; 3/4" AND SMALL CONDUIT; FLEX; SEALTITE; 3/4" AND SMALL

Floor : Room: EXT Equipment ID :
Q'ty at Location: 9 LNFT Estimated Cost : 0
Replacement Q'ty: 0 LNFT

Year Installed : 1980 Year of Last Insp.: 0 Life w/ Repair : 10 Life w/o Repair : 2

Urgency : REPAIR WITHIN 1 YEAR Condition: FAIR <25% Imp'tce : PRIMARY
Status : Service : CONTINUOUS Access :
Rep.Task: Rep.Cause: Rep.Sympt:

Purpose
MAINTENANCE

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CONDITION ASSESSMENT INFORMATION SYSTEM

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COMPLETE SURVEY DETAIL

Deficiency Group	Deficiency	Coverage (%)				Fail NSIP	
		Light	Moderate	Severe			
ELEC;RACEWAYS,FITTINGS,DEVICES	RACEWAY: IMPROPER FOR APPLICATION, CORRODED, PHYSICAL DAMAGE Etc.						50 N

Component : ELEC;RACEWAYS,FITTINGS Location: 2 FLEX CONDUIT TO VANE DR. MOTOR
 Type : CONDUIT; FLEX; SEALTITE; 3/4" AND SMALL CONDUIT; FLEX; SEALTITE; 3/4" AND SMALL

Floor : Room: EXT Equipment ID :
 Q'ty at Location: 8 LNFT Estimated Cost : 0
 Replacement Q'ty: 0 LNFT

Year Installed : 1980 Year of Last Insp.: 0 Life w/ Repair : 10 Life w/o Repair : 2

Urgency : REPAIR IN 1-2 YEARS Condition: FAIR <25% Imp'tce : PRIMARY
 Status : Service : CONTINUOUS Access :
 Rep.Task: Rep.Cause: Rep.Sympt:

Purpose
 MAINTENANCE

Deficiency Group	Deficiency	Coverage (%)				Fail NSIP	
		Light	Moderate	Severe			
ELEC;RACEWAYS,FITTINGS,DEVICES	RACEWAY: IMPROPER FOR APPLICATION, CORRODED, PHYSICAL DAMAGE Etc.						30 N

Component : ELEC;WIRES,CABLES,FITTINGS Location: 1 MCC-241-AN CUBICLE C-7
 Type : CONDUCTOR; #14 TO #12 AWG; 600 V CONDUCTOR; #14 TO #12 AWG; 600 V

Floor : Room: FARM Equipment ID :
 Q'ty at Location: 1 LNFT Estimated Cost : 0
 Replacement Q'ty: 0 LNFT

Year Installed : 0 Year of Last Insp.: 0 Life w/ Repair : 10 Life w/o Repair : 3

Urgency : REPAIR WITHIN 1 YEAR Condition: POOR <60% Imp'tce : PRIMARY
 Status : Service : CONTINUOUS Access :
 Rep.Task: Rep.Cause: Rep.Sympt:

Purpose
 MAINTENANCE

Survey IU Comments Comment Types
 Note Log : DUE TO TERMINAL BLOCK STACKING IN THE SURVEY INFO
 Photo Log : WIREWAYS, AND THE NEED TO MOVE THOSE AT
 Sketch Log: THE TOP FRONT TO GET TO THOSE IN THE
 BACK, SOLID WIRE WILL BREAK.

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CONDITION ASSESSMENT INFORMATION SYSTEM

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COMPLETE SURVEY DETAIL

Note Log :
Photo Log :
Sketch Log:
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N	Deficiency		Coverage (%)				100
	Group	Deficiency	Light	Moderate	Severe	Fail NSIP	
	ELEC;WIRES,CABLES,FITTINGS	CABLE, CONDUCTOR: IMPROPER, UNDER-RATED,					
		NOT MARKED, BURNED, DAMAGED Etc.					

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CONDITION ASSESSMENT INFORMATION SYSTEM

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Westinghouse Hanford Co.

COMPLETE SURVEY DETAIL

Component : ELEC;WIRES,CABLES,FITTINGS Location: 2 THROUGHOUT THE "AN" FARM
Type : CONDUCTOR; #14 TO #12 AWG; 600 V CONDUCTOR; #14 TO #12 AWG; 600 V

Floor : Room: FARM Equipment ID :
Q'ty at Location: 100 LNFT Estimated Cost : 0
Replacement Q'ty: 0 LNFT

Year Installed : 0 Year of Last Insp.: 0 Life w/ Repair : 10 Life w/o Repair : 0

Urgency : REPAIR IMMEDIATELY Condition: FAIL <100% Imp'tce : PRIMARY
Status : Service : CONTINUOUS Access :
Rep.Task: Rep.Cause: Rep.Sympt:

Purpose
H&S: IMMINENT HAZ
CODE VIOLATION

Survey IU Comments Comment Types
Note Log : BONDING JUMPERS THROUGHOUT THE FARM SURVEY INFO
Photo Log : LAID ON TOP OF THE GROUND ARE A VIOLATIO
Sketch Log: N OF THE NEC AND ARE NOT IN
COMPLIANCE WITH OSHA REGULATIONS. THEY
POSE A SERIOUS TRIPPING HAZARD TO
PERSONNEL.

Note Log :
Photo Log :
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CONDITION ASSESSMENT INFORMATION SYSTEM

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COMPLETE SURVEY DETAIL

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Sketch Log:

Deficiency Group	Deficiency	Coverage (%)	Light	Moderate	Severe	Fail	NSIP
ELEC;WIRES,CABLES,FITTINGS	INSTALLATION: IMPROPER; CONDUCTORS NOT ISOLATED, MARKED, JOINED; LOOSE Etc.						

100 N

Component : ELEC;DISCONNECT Location: 1 241-AN-US SUBSTATION
Type : CKT BKR; 600V;1000-1200A; NE 1 CKT BKR; 600V;1000-1200A; NE 1

Floor : Room: Equipment ID :
Q'ty at Location: 1 EACH Estimated Cost : 0
Replacement Q'ty: 0 EACH

Year Installed : 1978 Year of Last Insp.: 0 Life w/ Repair : 10 Life w/o Repair : 2

Urgency : REPAIR IMMEDIATELY Condition: FAIL <100% Imp'tce : PRIMARY
Status : Service : CONTINUOUS Access :
Rep.Task: Rep.Cause: Rep.Sympt:

Purpose
MAINTENANCE

Survey IU Comments	Comment Types
Note Log : BREAKER F8X402 LOCATED AT 241-AN-US	SURVEY INFO
Photo Log : SUBSTATION IS THE SINGLE FEED TO MOTOR	
Sketch Log: CONTROL CNTR. EDS-MCC-101 AT 241-AN-271.	
THIS BREAKER HAS NOT BEEN SUBJECTED TO MAINTENANCE STANDARDS TESTING. LOSS OF THIS BREAKER (no spare available) WILL LEAVE AN FARM WITHOUT POWER.	

Note Log :
Photo Log :
Sketch Log:
Note Log :
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Sketch Log:
Note Log :
Photo Log :
Sketch Log:

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CONDITION ASSESSMENT INFORMATION SYSTEM

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COMPLETE SURVEY DETAIL

Note Log :
Photo Log :
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Deficiency Group	Deficiency	Coverage (%)	Light	Moderate	Severe	Fail	NSIP
ELEC;DISCONNECT	PROTECTIVE RELAY: IMPROPER, DAMAGED, MISCALIBRATED, FAULTY INSTALLATION Etc.						100 N

Component : ELEC;MOTOR CONTROL CENTER;(ASSY) Location: 1 MCC-241-AN
Type : MCC;INCOM;3VERTSECT;15-25KVA XFM;NE1-12 MCC;INCOM;3VERTSECT;15-25KVA XFM;NE1-12

Floor : Room: Equipment ID :
Q'ty at Location: 1 EACH Estimated Cost : 0
Replacement Q'ty: 0 EACH

Year Installed : 1978 Year of Last Insp.: 0 Life w/ Repair : 15 Life w/o Repair : 0

Urgency : REPAIR IMMEDIATELY Condition: FAIL <100% Imp'tce : PRIMARY
Status : Service : CONTINUOUS Access :
Rep.Task: Rep.Cause: Rep.Sympt:

Purpose
MAINTENANCE

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CONDITION ASSESSMENT INFORMATION SYSTEM

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Wastinghouse Hanford Co.

COMPLETE SURVEY DETAIL

Survey IU Comments	Comment Types
Note Log :	MCC-241-AN DOORS WILL NOT CLOSE PROPERLY SURVEY INFO
Photo Log :	DUE TO BENT LATCHES. THIS HAS PERMITTED
Sketch Log:	ENTRY OF LARGE AMOUNTS OF DIRT AND DUST INTO THE BOTTOM WIREWAYS AND ALL CUBICLE S ABOVE.

Note Log :

Photo Log :

Sketch Log:

Note Log :

Photo Log :

Sketch Log:

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Note Log :

Photo Log :

Sketch Log:

Deficiency

Group

Deficiency

Coverage (%)

Light Moderate Severe Fail NSIP

ELEC;MOTOR CONTROL CENTER;(ASSY)

ENCLOSURE: IMPROPER, CORRODED, NOT SE-

n/a

n/a

n/a

100 N

CURED, PHYSICALLY DAMAGED Etc.

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CONDITION ASSESSMENT INFORMATION SYSTEM

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COMPLETE SURVEY DETAIL

Component : ELEC;MOTOR CONTROL CENTER;(ASSY) Location: 2 WIREWAY CUBICLE B-6
Type : MCC;INCOM;3VERTSECT;15-25KVA XFM;NE1-12 MCC;INCOM;3VERTSECT;15-25KVA XFM;NE1-12

Floor : Room: FARM Equipment ID :
Q'ty at Location: 1 EACH Estimated Cost : 0
Replacement Q'ty: 0 EACH

Year Installed : 0 Year of Last Insp.: 0 Life w/ Repair : 10 Life w/o Repair : 1

Urgency : REPAIR IMMEDIATELY Condition: FAIR <25% Imp'tce : PRIMARY
Status : Service : CONTINUOUS Access :
Rep.Task: Rep.Cause: Rep.Sympt:

Purpose
MAINTENANCE

Deficiency Group	Deficiency	Coverage (%)			
		Light	Moderate	Severe	Fail NSIP
ELEC;GROUNDING	TERMINATION LOOSE, IMPROPER, OR INADEQUATE.			50	N

Component : ELEC;MOTOR CONTROL CENTER;(ASSY) Location: 3 CLEAN MCC-241-AN THROUGHOUT
Type : MCC;INCOM;3VERTSECT;15-25KVA XFM;NE1-12 MCC;INCOM;3VERTSECT;15-25KVA XFM;NE1-12

Floor : Room: FARM Equipment ID :
Q'ty at Location: 1 EACH Estimated Cost : 0
Replacement Q'ty: 0 EACH

Year Installed : 0 Year of Last Insp.: 0 Life w/ Repair : 4 Life w/o Repair : 2

Urgency : REPAIR IMMEDIATELY Condition: POOR <60% Imp'tce : PRIMARY
Status : Service : CONTINUOUS Access :
Rep.Task: Rep.Cause: Rep.Sympt:

Purpose
MAINTENANCE

Deficiency Group	Deficiency	Coverage (%)			
		Light	Moderate	Severe	Fail NSIP
ELEC;MOTOR CONTROL CENTER;(ASSY)	ENCLOSURE: IMPROPER, CORRODED, NOT SECURED, PHYSICALLY DAMAGED Etc.				50

N

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CONDITION ASSESSMENT INFORMATION SYSTEM

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Westinghouse Hanford Co.

COMPLETE SURVEY DETAIL

Component : ELEC;MOTOR CONTROL CENTER;(ASSY) Location: 1 OL RESET ACTUATORS REMOVED
 Type : COMB DISC &STAR;W/ENC;600V;SZ 00; NE 1 COMB DISC &STAR;W/ENC;600V;SZ 00; NE 1

Floor : Room: MCC Equipment ID :
 Q'ty at Location: 2 EACH Estimated Cost : 0
 Replacement Q'ty: 0 EACH

Year Installed : 0 Year of Last Insp.: 0 Life w/ Repair : 5 Life w/o Repair : 5

Urgency : REPAIR WITHIN 1 YEAR Condition: POOR <60% Imp'tce : PRIMARY
 Status : Service : CONTINUOUS Access :
 Rep.Task: Rep.Cause: Rep.Sympt:

Purpose
 MAINTENANCE

Deficiency Group	Deficiency	Coverage (%)	
		Light Moderate Severe Fail NSIP	
ELEC;MOTOR CONTROL CENTER;(ASSY)	DISCONNECT: IMPROPER, PHYSICALLY DAMAGED		80
N	INACCESSIBLE, UNPROTECTED Etc.		

Component : ELEC;MOTOR CONTROL CENTER;(ASSY) Location: 1 MCC-241-AN CUBICLES B-3 & B-4
 Type : DISC + START;W/ENCL;600V;SZ 1;3PH; NE 1 DISC + START;W/ENCL;600V;SZ 1;3PH; NE 1

Floor : Room: EXT Equipment ID :
 Q'ty at Location: 1 EACH Estimated Cost : 0
 Replacement Q'ty: 0 EACH

Year Installed : 0 Year of Last Insp.: 0 Life w/ Repair : 10 Life w/o Repair : 3

Urgency : REPAIR IMMEDIATELY Condition: ADQT <10% Imp'tce : PRIMARY
 Status : Service : CONTINUOUS Access :
 Rep.Task: Rep.Cause: Rep.Sympt:

Purpose
 MAINTENANCE

Deficiency Group	Deficiency	Coverage (%)	
		Light Moderate Severe Fail NSIP	
ELEC;MOTOR CONTROL CENTER;(ASSY)	ENCLOSURE: IMPROPER, CORRODED, NOT SE-		70
N	CURED, PHYSICALLY DAMAGED Etc.		

WBS : Elec;Spcl;Heating,Baseboard Radiation Location: 1 Asset - Wide

Survey Asset : 241AN-0000 UNDRGRND WASTE STOR TANK FARM UNDRGRND WASTE
 Asset Class : BUILDINGS;GENERAL Use Code: Nuclear Contaminated ADF : FULL CAS

Inspector : GILMOUR, GARY Discipline : Electrical

Survey Date : 02-AUG-95 Survey Time: 10:15:56 Survey Type: CAS
 Survey Version : 95-FY Insp-CAIS Software Version: 1.200

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CONDITION ASSESSMENT INFORMATION SYSTEM

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Westinghouse Hanford Co.

COMPLETE SURVEY DETAIL

WBS : Elec;Serv + Distrib;Low Voltage Distrib Location: 1 Asset - Wide

Component : ELEC;RACEWAYS,FITTINGS Location: 1 JBX-A SE CORNER OF FARM
Type : PULL/JUNCTION BOX; 24X24X8 PULL/JUNCTION BOX; 24X24X8Floor : Room: Equipment ID :
Q'ty at Location: 1 LNFT Estimated Cost : 0
Replacement Q'ty: 0 LNFT

Year Installed : 1980 Year of Last Insp.: 0 Life w/ Repair : Life w/o Repair : 1

Urgency : REPAIR IMMEDIATELY Condition: FAIL <100% Imp'tce : PRIMARY
Status : Service : CONTINUOUS Access :
Rep.Task: Rep.Cause: Rep.Sympt:Purpose
CODE VIOLATION
MAINTENANCE

Deficiency Group	Deficiency	Coverage (%)	
		Light Moderate Severe Fail NSIP	
ELEC;RACEWAYS,FITTINGS,DEVICES	FITTINGS/DEVICES: IMPROPER, BROKEN, MISSING, Etc.		100 N

Component : ELEC;RACEWAYS,FITTINGS Location: 1 TRANS PNL 101/ PIT AN-01C
Type : PULL/JUNCTION BOX; 36X36X8 PULL/JUNCTION BOX; 36X36X8Floor : Room: Equipment ID :
Q'ty at Location: 1 LNFT Estimated Cost : 0
Replacement Q'ty: 0 LNFT

Year Installed : 1980 Year of Last Insp.: 0 Life w/ Repair : 15 Life w/o Repair : 3

Urgency : REPAIR IN 1-2 YEARS Condition: POOR <60% Imp'tce : PRIMARY
Status : Service : CONTINUOUS Access :
Rep.Task: Rep.Cause: Rep.Sympt:Purpose
MAINTENANCESurvey IU Comments Comment Types
Note Log : DOOR SEALS ARE ROTTED SURVEY INFO
Photo Log :
Sketch Log:

Deficiency Group	Deficiency	Coverage (%)	
		Light Moderate Severe Fail NSIP	

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CONDITION ASSESSMENT INFORMATION SYSTEM

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Westinghouse Hanford Co.

COMPLETE SURVEY DETAIL

ELEC;RACEWAYS,FITTINGS,DEVICES	FITTINGS/DEVICES: IMPROPER, BROKEN, MISSING, Etc.	80	N
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Component : ELEC;RACEWAYS,FITTINGS	Location: 2 VTA-PNL-103 OUTLET CAM
Type : PULL/JUNCTION BOX; 36X36X8	PULL/JUNCTION BOX; 36X36X8

Floor :	Room:	Equipment ID :
Q'ty at Location: 1 LNFT		Estimated Cost : 0
Replacement Q'ty: 0 LNFT		

Year Installed : 0	Year of Last Insp.: 0	Life w/ Repair : 20	Life w/o Repair : 4
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Urgency : REPAIR IN 1-2 YEARS	Condition: POOR <60%	Imp'tce : PRIMARY
Status :	Service : CONTINUOUS	Access :
Rep.Task:	Rep.Cause:	Rep.Sympt:

Purpose
CODE VIOLATION
MAINTENANCE

Survey IU Comments	Comment Types
Note Log : A CONDUIT "T" IS AT THE BOTTOM OF THE EN	SURVEY INFO
Photo Log : CLOSURE WITH ITS COVER MISSING AND A FIT	
Sketch Log : TING AT ONE END WHICH SUPPORTS A MULTI C	
	ONDUCTOR CABLE IS MISSING.

Deficiency		Coverage (%)	
Group	Deficiency	Light Moderate Severe Fail NSIP	
ELEC;RACEWAYS,FITTINGS,DEVICES	FITTINGS/DEVICES: IMPROPER, BROKEN, MISSING, Etc.	90	N

Component : ELEC;PANELBOARDS	Location: 1 HEAT TRACE PNL W OF PIT AN-a
Type : PANELBOARD; 120V; 15-99A;1-3POLE	PANELBOARD; 120V; 15-99A;1-3POLE

Floor :	Room:	Equipment ID :
Q'ty at Location: 1 EACH		Estimated Cost : 0
Replacement Q'ty: 0 EACH		

Year Installed : 1980	Year of Last Insp.: 0	Life w/ Repair :	Life w/o Repair : 5
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Urgency : REPAIR IN 1-2 YEARS	Condition: FAIR <25%	Imp'tce : PRIMARY
Status :	Service : CONTINUOUS	Access :
Rep.Task:	Rep.Cause:	Rep.Sympt:

Purpose
MAINTENANCE

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CONDITION ASSESSMENT INFORMATION SYSTEM

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Westinghouse Hanford Co.

COMPLETE SURVEY DETAIL

Survey IU Comments

Comment Types

Note Log : DIRECTORY UPDATE NEEDED.

SURVEY INFO

Photo Log :

Sketch Log:

Deficiency	Deficiency	Coverage (%)	
Group		Light Moderate Severe Fail NSIP	
ELEC;PANELBOARDS;(ASSY)	MARKING: IMPROPER, MISSING, ILLEGIBLE		100 N
Etc.			

CONDITION ASSESSMENT INFORMATION SYSTEM

Report : COMPLETE SURVEY DETAIL

Filename : RPTCSD.lis

Run by : CAIS12

Report Date : 16-NOV-1995 07:44

Parameters Entered

Survey Asset ID : 241AW%

Survey Asset ID Suffix: %

Inspector ID : GMG

Survey Type : %

Survey Version : %

Discipline : %

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CONDITION ASSESSMENT INFORMATION SYSTEM

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Westinghouse Hanford Co.

COMPLETE SURVEY DETAIL

Area : 13050 HANFORD

Site Asset: 241AW-0000 UNDRGRND WASTE STOR TANK FARM UNDRGRND WASTE

Survey Asset : 241AW-0000 UNDRGRND WASTE STOR TANK FARM UNDRGRND WASTE
Asset Class : BUILDINGS;GENERAL Use Code: Nuclear Contaminated ADF : FULL CAS

Inspector : GILMOUR, GARY

Discipline : Electrical

Survey Date : 28-JUN-95

Survey Time: 07:04:19

Survey Type: CAS

Survey Version : 95-FY

Insp-CAIS Software Version: 1.200

Survey Asset Comments

Comment Types

Note Log : DURING INSPECTION OF K1-5-2 CUBICLE, SURVEY INFO
 Photo Log : K1-5-2 TRIPPED OFF AND K1-5-1 PICKED UP
 Sketch Log : AS DESIGNED. THE AUTO FUNCTION TO
 TRANSFER BACK TO K1-5-2 DOES NOT
 WORK. MUST BE DONE MANUALLY.

WBS : Elec;Serv + Distrib;Low Voltage Distrib

Location: 1 Asset - Wide

Component : ELEC;RACEWAYS,FITTINGS

Location: 1 RAMP 2 POLE CONDUIT DAMAGED

Type : CONDUIT; RIGID/EMT; 1 TO 1 1/4"

CONDUIT; RIGID/EMT; 1 TO 1 1/4"

Floor :

Room:

Equipment ID :

Q'ty at Location: 20 LNFT

Estimated Cost : 0

Replacement Q'ty: 0 LNFT

Year Installed : 1980

Year of Last Insp.: 0

Life w/ Repair : 20

Life w/o Repair :

Urgency : REPAIR WITHIN 1 YEAR

Condition: POOR <60%

Imp'tce : PRIMARY

Status :

Service : CONTINUOUS

Access :

Rep.Task:

Rep.Cause:

Rep.Sympt:

Purpose

MAINTENANCE

CODE VIOLATION

Deficiency

Coverage (%)

Group

Deficiency

Light Moderate Severe Fail NSIP

ELEC;RACEWAYS,FITTINGS,DEVICES
MISSING, Etc.

FITTINGS/DEVICES: IMPROPER, BROKEN,

80

N

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CONDITION ASSESSMENT INFORMATION SYSTEM

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Westinghouse Hanford Co.

COMPLETE SURVEY DETAIL

Component : ELEC;WIRES,CABLES,FITTINGS Location: 1 LEAK DET.BOXES THRUOUT AW FARM
Type : CONDUCTOR; #14 TO #12 AWG; 600 V CONDUCTOR; #14 TO #12 AWG; 600 V

Floor : Room: Equipment ID :
Q'ty at Location: 4 LNFT Estimated Cost : 0
Replacement Q'ty: 0 LNFT

Year Installed : 1980 Year of Last Insp.: 0 Life w/ Repair : 8 Life w/o Repair :

Urgency : REPAIR WITHIN 1 YEAR Condition: POOR <60% Imp'tce : PRIMARY
Status : Service : CONTINUOUS Access :
Rep.Task: Rep.Cause: Rep.Sympt:

Purpose
MAINTENANCE

Survey IU Comments Comment Types
Note Log : RECTIFIERS WITHIN THE LEAK DETECTOR SURVEY INFO
Photo Log : BOXES THROUGHOUT ARE IMPROPERLY INSTALLE
Sketch Log: D. INSTALL SMALL TERM. STRIPS
AND MOUNT IN A WORKMANSHIP MANNER.

Deficiency Group	Deficiency	Coverage (%)	Light	Moderate	Severe	Fail	NSIP
ELEC;WIRES,CABLES,FITTINGS	INSTALLATION: IMPROPER; CONDUCTORS NOT ISOLATED, MARKED, JOINED; LOOSE Etc.	80					N

Component : ELEC;WIRES,CABLES,FITTINGS Location: 2 SPECIFIC GRAVITY STAT.102-AW
Type : CONDUCTOR; #14 TO #12 AWG; 600 V CONDUCTOR; #14 TO #12 AWG; 600 V

Floor : Room: Equipment ID :
Q'ty at Location: 20 LNFT Estimated Cost : 0
Replacement Q'ty: 0 LNFT

Year Installed : 0 Year of Last Insp.: 0 Life w/ Repair : 10 Life w/o Repair :

Urgency : REPAIR WITHIN 1 YEAR Condition: POOR <60% Imp'tce : PRIMARY
Status : Service : INTERMITTENT Access :
Rep.Task: Rep.Cause: Rep.Sympt:

Purpose
MAINTENANCE

16-NOV-95
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CONDITION ASSESSMENT INFORMATION SYSTEM

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Westinghouse Hanford Co.

COMPLETE SURVEY DETAIL

Component : ELEC;WIRES,CABLES,FITTINGS Location: 4 K1 STACK MON.MUFFIN FAN LEADS
 Type : CONDUCTOR; #14 TO #12 AWG; 600 V CONDUCTOR; #14 TO #12 AWG; 600 V

Floor : Room: Equipment ID :
 Q'ty at Location: 1 LNFT Estimated Cost : 0
 Replacement Q'ty: 0 LNFT

Year Installed : 1980 Year of Last Insp.: 0 Life w/ Repair : 15 Life w/o Repair :

Urgency : REPAIR IMMEDIATELY Condition: FAIL <100% Imp'tce : SECONDARY
 Status : Service : INTERMITTENT Access :
 Rep.Task: Rep.Cause: Rep.Sympt:

Purpose
 H&S: IMMINENT HAZ
 MAINTENANCE

Survey IU Comments Comment Types
 Note Log : SERIOUS DETERIORATION TO POWER LEADS AT SURVEY INFO
 Photo Log : THE CABINET EXHAUSTERS
 Sketch Log:

Deficiency Coverage (%)
 Group Deficiency Light Moderate Severe Fail NSIP
 ELEC;WIRES,CABLES,FITTINGS CABLE, CONDUCTOR: IMPROPER, UNDER-RATED, 100
 N
 NOT MARKED, BURNED, DAMAGED Etc.

Component : ELEC;WIRES,CABLES,FITTINGS Location: 1 MCC 241-AW-271 CUBICLE C-1
 Type : TERM/SPLICE; COND;600V; 14AWG-12AWG; EA TERM/SPLICE; COND;600V; 14AWG-12AWG; EA

Floor : Room: Equipment ID :
 Q'ty at Location: 1 LNFT Estimated Cost : 0
 Replacement Q'ty: 0 LNFT

Year Installed : 0 Year of Last Insp.: 0 Life w/ Repair : 10 Life w/o Repair :

Urgency : REPAIR IMMEDIATELY Condition: FAIR <25% Imp'tce :
 Status : Service : Access :
 Rep.Task: Rep.Cause: Rep.Sympt:

Purpose
 MAINTENANCE

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CONDITION ASSESSMENT INFORMATION SYSTEM

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COMPLETE SURVEY DETAIL

Component : ELEC;WIRES,CABLES,FITTINGS Location: 1 MCC 241-AW-271 CUB.B-3
Type : CONDUCTOR; #3 TO #4AWG; 600 V CONDUCTOR; #3 TO #4AWG; 600 V

Floor : Room: Equipment ID :
Q'ty at Location: 10 LNFT Estimated Cost : 0
Replacement Q'ty: 0 LNFT

Year Installed : 1980 Year of Last Insp.: 0 Life w/ Repair : Life w/o Repair :

Urgency : REPAIR WITHIN 1 YEAR Condition: ADQT <10% Imp'tce : NO IMPACT
Status : Service : STANDBY/SPARE Access :
Rep.Task: Rep.Cause: Rep.Sympt:

Purpose
MAINTENANCE

Survey IU Comments Comment Types
Note Log : A #4 AWG, TYPE RHH CONDUCTOR IS CUT OFF SURVEY INFO
Photo Log : IN CUBICLE B-3. NOT PROPERLY TAPED AND
Sketch Log: IDENTIFIED.

Deficiency Group	Deficiency	Coverage (%)	Light	Moderate	Severe	Fail	NSIP
ELEC;WIRES,CABLES,FITTINGS	INSTALLATION: IMPROPER; CONDUCTORS NOT ISOLATED, MARKED, JOINED; LOOSE Etc.	20					N

Component : ELEC;WIRES,CABLES,FITTINGS Location: 2 S & SO CABLE THRUOUT AW FARM
Type : CONDUCTOR; #3 TO #4AWG; 600 V CONDUCTOR; #3 TO #4AWG; 600 V

Floor : Room: Equipment ID :
Q'ty at Location: 250 LNFT Estimated Cost : 0
Replacement Q'ty: 0 LNFT

Year Installed : 0 Year of Last Insp.: 0 Life w/ Repair : 10 Life w/o Repair :

Urgency : REPAIR IMMEDIATELY Condition: FAIL <100% Imp'tce :
Status : Service : Access :
Rep.Task: Rep.Cause: Rep.Sympt:

Purpose
H&S: IMMINENT HAZ
MAINTENANCE

Westinghouse Hanford Co.

COMPLETE SURVEY DETAIL

Survey IU Comments	Comment Types
Note Log : CABLE TYPES S & SO THRUOUT THE FARM ARE	SURVEY INFO
Photo Log : SEVERELY DETERIORATED AND INSULATION IS	
Sketch Log: FALLING OFF THE WIRE. THESE CABLES MUST BE REPLACED ASAP. IF THEY FAIL, SERIOUS DAMAGE TO EQUIP. AND INJURY TO PERSONNEL MAY OCCUR.	

N	Deficiency Group	Deficiency	Coverage (%)				Fail NSIP
			Light	Moderate	Severe		
	ELEC;WIRES,CABLES,FITTINGS	CABLE, CONDUCTOR: IMPROPER, UNDER-RATED,					100
		NOT MARKED, BURNED, DAMAGED Etc.					

Component : ELEC;DISCONNECT Location: 1 MCC 241-AW-271 CUB.A-3
Type : CKT BKR; 600V; 30-100A CKT BKR; 600V; 30-100A

Floor : Room: Equipment ID :
Q'ty at Location: 1 EACH Estimated Cost : 0
Replacement Q'ty: 0 EACH

Year Installed : 1980 Year of Last Insp.: 0 Life w/ Repair : 10 Life w/o Repair : 1

Urgency : REPAIR WITHIN 1 YEAR Condition: ADQT <10% Imp'tce : PRIMARY
Status : Service : CONTINUOUS Access :
Rep.Task: Rep.Cause: Rep.Sympt:

Purpose
MAINTENANCE

Survey IU Comments	Comment Types
Note Log :	THE CENTER LOAD LEAD IS HEAVILY TAPED. SURVEY INFO
Photo Log :	IF TAPING IS DUE TO A SPLICE, REMOVE
Sketch Log:	AND REPLACE.

Deficiency Group	Deficiency	Coverage (%)	Light	Moderate	Severe	Fail	NSIP
ELEC;DISCONNECT	CONTROL MODULE: DEFECTIVE, LOOSE BOARDS/ WIRING, PHYSICALLY DAMAGED Etc.	30					

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CONDITION ASSESSMENT INFORMATION SYSTEM

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COMPLETE SURVEY DETAIL

Component : ELEC;DISCONNECT Location: 1 PUMP CONTROLLER 102-P2
Type : SWIT; CONT;600V; 9-27A;SZ 00-1 SWIT; CONT;600V; 9-27A;SZ 00-1

Floor : Room: Equipment ID :
Q'ty at Location: 1 EACH Estimated Cost : 0
Replacement Q'ty: 0 EACH

Year Installed : 1980 Year of Last Insp.: 0 Life w/ Repair : 10 Life w/o Repair :

Urgency : REPAIR IMMEDIATELY Condition: FAIL <100% Imp'tce : PRIMARY
Status : Service : INTERMITTENT Access :
Rep.Task: Rep.Cause: Rep.Sympt:

Purpose
MAINTENANCE

Survey IU Comments Comment Types
Note Log : PUMP CONTROLLER 102-P2 ENCLOSURE AND ALL SURVEY INFO
Photo Log : OTHER ENCLOSURES WITHIN THE FARM THAT
Sketch Log: HAVE INDICATING LIGHTS INSTALLED ON TOP
MUST HAVE THE IND.LT. MOUNTING PROPERLY
SEALED. WATER IS COMING IN AROUND THE
LIGHT SEAL GASKET.

Deficiency Group	Deficiency	Coverage (%)	Light	Moderate	Severe	Fail	NSIP
ELEC;DISCONNECT	ENCLOSURE: IMPROPER, CORRODED, NOT SECURED, PHYSICALLY DAMAGED Etc.	100	N				

Component : ELEC;DISCONNECT Location: 2 LEAK DET. FLUSH PIT OPENING
Type : SWIT; CONT;600V; 9-27A;SZ 00-1 SWIT; CONT;600V; 9-27A;SZ 00-1

Floor : Room: Equipment ID :
Q'ty at Location: 1 EACH Estimated Cost : 0
Replacement Q'ty: 0 EACH

Year Installed : 1980 Year of Last Insp.: 0 Life w/ Repair : 10 Life w/o Repair :

Urgency : REPAIR IMMEDIATELY Condition: POOR <60% Imp'tce : PRIMARY
Status : Service : CONTINUOUS Access :
Rep.Task: Rep.Cause: Rep.Sympt:

Purpose
MAINTENANCE
CODE VIOLATION

Deficiency Group	Deficiency	Coverage (%)	Light	Moderate	Severe	Fail	NSIP
ELEC;DISCONNECT	ENCLOSURE: IMPROPER, CORRODED, NOT SECURED, PHYSICALLY DAMAGED Etc.	80	N				

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CONDITION ASSESSMENT INFORMATION SYSTEM

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Westinghouse Hanford Co.

COMPLETE SURVEY DETAIL

Component : ELEC;DISCONNECT Location: 3 LEAK DET.PROCESS LINE SL-168
 Type : SWIT; CONT;600V; 9-27A;SZ 00-1 SWIT; CONT;600V; 9-27A;SZ 00-1

Floor : Room: Equipment ID :
 Q'ty at Location: 1 EACH Estimated Cost : 0
 Replacement Q'ty: 0 EACH

Year Installed : 0 Year of Last Insp.: 0 Life w/ Repair : 10 Life w/o Repair :

Urgency : REPAIR IMMEDIATELY Condition: POOR <60% Imp'tce : PRIMARY
 Status : Service : CONTINUOUS Access :
 Rep.Task: Rep.Cause: Rep.Sympt:

Purpose
 MAINTENANCE
 CODE VIOLATION

Deficiency Group	Deficiency	Coverage (%)	Light	Moderate	Severe	Fail	NSIP
ELEC;DISCONNECT	ENCLOSURE: IMPROPER, CORRODED, NOT SE-CURED, PHYSICALLY DAMAGED Etc.	80					N

Component : ELEC;DISCONNECT Location: 4 PUMP CONT. P-104-1 LOAD CABLE
 Type : SWIT; CONT;600V; 9-27A;SZ 00-1 SWIT; CONT;600V; 9-27A;SZ 00-1

Floor : Room: Equipment ID :
 Q'ty at Location: 1 EACH Estimated Cost : 0
 Replacement Q'ty: 0 EACH

Year Installed : 1980 Year of Last Insp.: 0 Life w/ Repair : 15 Life w/o Repair :

Urgency : REPAIR IMMEDIATELY Condition: FAIL <100% Imp'tce : PRIMARY
 Status : Service : CONTINUOUS Access :
 Rep.Task: Rep.Cause: Rep.Sympt:

Purpose
 CODE VIOLATION
 MAINTENANCE
 H&S: IMMINENT HAZ

Survey IU Comments	Comment Types
Note Log : THE LOAD CABLE IS SO CABLE. THE CABLE	SURVEY INFO
Photo Log : JACKET IS SEVERELY DETERIORATED EXPOSING	
Sketch Log: THE CONDUCTOR WRAP.	

Deficiency Group	Deficiency	Coverage (%)	Light	Moderate	Severe	Fail	NSIP

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CONDITION ASSESSMENT INFORMATION SYSTEM

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Westinghouse Hanford Co.

COMPLETE SURVEY DETAIL

ELEC;DISCONNECT

CONTROL WIRING: IMPROPER INSTALLATION,
INDICATORS NOT WORKING/OBSCURED Etc.

100 N

Component : ELEC;DISCONNECT

Location: 5 LEAK DET.CENT.PMP PIT TANK 104

Type : SWIT; CONT;600V; 9-27A;SZ 00-1

SWIT; CONT;600V; 9-27A;SZ 00-1

Floor :

Room:

Equipment ID :

Q'ty at Location: 1 EACH

Estimated Cost : 0

Replacement Q'ty: 0 EACH

Year Installed : 1980

Year of Last Insp.: 0

Life w/ Repair : 10

Life w/o Repair : 5

Urgency : REPAIR IMMEDIATELY

Condition: POOR <60%

Imp'tce : PRIMARY

Status :

Service : CONTINUOUS

Access :

Rep.Task:

Rep.Cause:

Rep.Sympt:

Purpose

CODE VIOLATION

MAINTENANCE

Deficiency

Group

ELEC;DISCONNECT

Deficiency

ENCLOSURE: IMPROPER, CORRODED, NOT SE-
CURED, PHYSICALLY DAMAGED Etc.

Coverage (%)

Light Moderate Severe Fail NSIP

80

N

Component : ELEC;DISCONNECT

Location: 1 LEAK DET.DR334 &DR335 OPENINGS

Type : SWIT; CONT;600V; 30-45A;SZ 2

SWIT; CONT;600V; 30-45A;SZ 2

Floor :

Room:

Equipment ID :

Q'ty at Location: 1 EACH

Estimated Cost : 0

Replacement Q'ty: 0 EACH

Year Installed : 1980

Year of Last Insp.: 0

Life w/ Repair : 10

Life w/o Repair : 5

Urgency : REPAIR IMMEDIATELY

Condition: FAIL <100%

Imp'tce : PRIMARY

Status :

Service : CONTINUOUS

Access :

Rep.Task:

Rep.Cause:

Rep.Sympt:

Purpose

MAINTENANCE

Deficiency

Group

ELEC;DISCONNECT

Deficiency

ENCLOSURE: IMPROPER, CORRODED, NOT SE-
CURED, PHYSICALLY DAMAGED Etc.

Coverage (%)

Light Moderate Severe Fail NSIP

100 N

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CONDITION ASSESSMENT INFORMATION SYSTEM

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COMPLETE SURVEY DETAIL

Component : ELEC;DISCONNECT Location: 1 MCC 241-AW LOCAL CUBICLE C-1
Type : SWIT; CONT;600V; 60-100A; SZ 3 SWIT; CONT;600V; 60-100A; SZ 3

Floor : Room: Equipment ID :
Q'ty at Location: 1 EACH Estimated Cost : 0
Replacement Q'ty: 0 EACH

Year Installed : 1980 Year of Last Insp.: 0 Life w/ Repair : Life w/o Repair :

Urgency : REPAIR IMMEDIATELY Condition: FAIL <100% Imp'tce : NO IMPACT
Status : Service : NOT IN SERVICE Access :
Rep.Task: Rep.Cause: Rep.Sympt:

Purpose
H&S: IMMINENT HAZ
MAINTENANCE

Survey IU Comments Comment Types
Note Log : PRINT H-2-90927 SHOWS THE PORT. EXHAUST SURVEY INFO
Photo Log : FROM CUBICLE C-1 OUT OF SERVICE.
Sketch Log : PROPERLY DEACTIVATE AND TAG THE CUBICLE
DOOR.

Deficiency Group	Deficiency	Coverage (%)			
		Light	Moderate	Severe	Fail NSIP
ELEC;DISCONNECT	MARKING: IMPROPER, MISSING, ILLEGIBLE				
	Etc.				
					100 N

Component : ELEC;DISCONNECT Location: 2 MCC 241-AW LOCAL CUBICLE A-5
Type : SWIT; CONT;600V; 60-100A; SZ 3 SWIT; CONT;600V; 60-100A; SZ 3

Floor : Room: Equipment ID :
Q'ty at Location: 1 EACH Estimated Cost : 0
Replacement Q'ty: 0 EACH

Year Installed : 1980 Year of Last Insp.: 0 Life w/ Repair : Life w/o Repair :

Urgency : REPAIR IMMEDIATELY Condition: FAIL <100% Imp'tce : NO IMPACT
Status : Service : NOT IN SERVICE Access :
Rep.Task: Rep.Cause: Rep.Sympt:

Purpose
H&S: IMMINENT HAZ
MAINTENANCE

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CONDITION ASSESSMENT INFORMATION SYSTEM

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Westinghouse Hanford Co.

COMPLETE SURVEY DETAIL

Component : ELEC;PANELBOARDS Location: 2 PANELBOARD C DIRECTORY/DIRT
 Type : PANELBOARD; 240V; 100A;1 PHASE; 3 W PANELBOARD; 240V; 100A;1 PHASE; 3 W

Floor : Room: Equipment ID :
 Q'ty at Location: 1 EACH Estimated Cost : 0
 Replacement Q'ty: 0 EACH

Year Installed : 1980 Year of Last Insp.: 0 Life w/ Repair : 10 Life w/o Repair :

Urgency : REPAIR WITHIN 1 YEAR Condition: POOR <60% Imp'tce : PRIMARY
 Status : Service : CONTINUOUS Access :
 Rep.Task: Rep.Cause: Rep.Sympt:

Purpose
 MAINTENANCE

Survey IU Comments Comment Types
 Note Log : THE DIRECTORY NEEDS TO BE UPDATED AND TH SURVEY INFO
 Photo Log : E ENCLOSURE CLEANED.
 Sketch Log:

Deficiency Group	Deficiency	Coverage (%)					
		Light	Moderate	Severe	Fail NSIP		
ELEC;PANELBOARDS;(ASSY)	ENCLOSURE: IMPROPER, CORRODED, NOT SE-CURED, PHYSICALLY DAMAGED Etc.					70	N
ELEC;PANELBOARDS;(ASSY)	MARKING: IMPROPER, MISSING, ILLEGIBLE Etc.					80	N

Component : ELEC;PANELBOARDS Location: 1 PNL.B / BRKR.LOC.32 & 34 OPEN
 Type : PANELBOARD; 480V; 225-399A; 42 CKTS PANELBOARD; 480V; 225-399A; 42 CKTS

Floor : Room: Equipment ID :
 Q'ty at Location: 1 EACH Estimated Cost : 0
 Replacement Q'ty: 0 EACH

Year Installed : 0 Year of Last Insp.: 0 Life w/ Repair : 10 Life w/o Repair :

Urgency : REPAIR IMMEDIATELY Condition: FAIL <100% Imp'tce : PRIMARY
 Status : Service : CONTINUOUS Access :
 Rep.Task: Rep.Cause: Rep.Sympt:

Purpose
 CODE VIOLATION
 MAINTENANCE

Deficiency Group	Deficiency	Coverage (%)					
		Light	Moderate	Severe	Fail NSIP		

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CONDITION ASSESSMENT INFORMATION SYSTEM

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Westinghouse Hanford Co.

COMPLETE SURVEY DETAIL

ELEC;PANELBOARDS;(ASSY)

ENCLOSURE: IMPROPER, CORRODED, NOT SECURED, PHYSICALLY DAMAGED Etc.

100 N

WBS : Elec;Lighting;Luminaires

Location: 1 Asset - Wide

Component : ELEC; EXTERIOR

Location: 1 POLE 3 BALLAST ENCLOSURE

Type : FIXTURE; EXT POLE MTD; MERCURY;250-400W FIXTURE; EXT POLE MTD; MERCURY;250-400W

Floor : Room:

Equipment ID :

Q'ty at Location: 1 EACH

Estimated Cost : 0

Replacement Q'ty: 0 EACH

Year Installed : 0

Year of Last Insp.: 0

Life w/ Repair : 10

Life w/o Repair :

Urgency : REPAIR WITHIN 1 YEAR

Condition: POOR <60%

Imp'tce : SECONDARY

Status :

Service : INTERMITTENT

Access :

Rep.Task:

Rep.Cause:

Rep.Sympt:

Purpose

MAINTENANCE

Survey IU Comments

Comment Types

Note Log : THE BALLAST ENCLOSURE IS SEVERELY RUSTED SURVEY INFO

Photo Log :

Sketch Log:

Deficiency

Group

Deficiency

Coverage (%)

ELEC;LIGHTING;BALLAST ONLY

BALLAST DEFECTIVE; LEAKING;DIRTY; OILY;

60

N

INAPPROPRIATE;ETC

Component : ELEC; EXTERIOR

Location: 2 POLE 6 CONDUIT SUPPORT INADEQ.

Type : FIXTURE; EXT POLE MTD; MERCURY;250-400W FIXTURE; EXT POLE MTD; MERCURY;250-400W

Floor : Room:

Equipment ID :

Q'ty at Location: 1 EACH

Estimated Cost : 0

Replacement Q'ty: 0 EACH

Year Installed : 0

Year of Last Insp.: 0

Life w/ Repair : 10

Life w/o Repair :

Urgency : REPAIR IN 1-2 YEARS

Condition: FAIR <25%

Imp'tce : SECONDARY

Status :

Service : INTERMITTENT

Access :

Rep.Task:

Rep.Cause:

Rep.Sympt:

Purpose

MAINTENANCE

CODE VIOLATION

CONDITION ASSESSMENT INFORMATION SYSTEM

Report : COMPLETE SURVEY DETAIL

Filename : RPTCSD.lis

Run by : CAIS12

Report Date : 16-NOV-1995 08:58

Parameters Entered

Survey Asset ID : 241AY%

Survey Asset ID Suffix: %

Inspector ID : GMG

Survey Type : %

Survey Version : %

Discipline : %

WHC-SD-W314-ES-018, Rev 0

16-NOV-95

CONDITION ASSESSMENT INFORMATION SYSTEM
Westinghouse Hanford Co.

Page 1 of 7

COMPLETE SURVEY DETAIL

Area : 13050 HANFORD

Site Asset: 241AY-0000 WASTE DISPOSAL TANK FARM WASTE DISPOSAL

Survey Asset : 241AY-0000 WASTE DISPOSAL TANK FARM WASTE DISPOSAL

Asset Class : BUILDINGS;GENERAL Use Code: Nuclear Waste Proces ADF : FULL CAS

Inspector : GILMOUR, GARY

Discipline : Electrical

Survey Date : 26-JUL-95

Survey Time: 14:31:10

Survey Type: CAS

Survey Version : 95-FY

Insp-CAIS Software Version: 1.200

WBS : Elec;Serv + Distrib;Low Voltage Distrib Location: 1 Asset - Wide

Component : ELEC;WIRES,CABLES,FITTINGS

Location: 1 VENT CONT PNL POWER CABLE

Type : TERM/SPLIC;CAB;SHLD AL;5KV;2/0-350kcm;EA TERM/SPLIC;CAB;SHLD AL;5KV;2/0-350kcm;EA

Floor :

Room:

Equipment ID :

Q'ty at Location: 3 LNFT

Estimated Cost : 0

Replacement Q'ty: 0 LNFT

Year Installed : 1976

Year of Last Insp.: 0

Life w/ Repair : 15

Life w/o Repair : 1

Urgency : REPAIR IMMEDIATELY

Condition: FAIL <100%

Imp'tce : PRIMARY

Status :

Service : CONTINUOUS

Access :

Rep.Task:

Rep.Cause:

Rep.Sympt:

Purpose

CODE VIOLATION

MAINTENANCE

EFFICIENCY

Survey IU Comments

Comment Types

Note Log : POWER CABLE STRANDS HAVE BEEN CUT OFF. SURVEY INFO

Photo Log :

Sketch Log:

Deficiency

Coverage (%)

Group

Deficiency

Light Moderate Severe Fail NSIP

ELEC;WIRES,CABLES,FITTINGS

INSTALLATION: IMPROPER; CONDUCTORS NOT

100 N

ISOLATED, MARKED, JOINED; LOOSE Etc.

16-NOV-95

CONDITION ASSESSMENT INFORMATION SYSTEM
Westinghouse Hanford Co.

Page 2 of 7

COMPLETE SURVEY DETAIL

Component : ELEC;DISCONNECT Location: 1 VENT CONT PNL DOOR SEALS
Type : SWIT; CONT; 125-200A; SZ 4 SWIT; CONT; 125-200A; SZ 4

Floor : Room: Equipment ID :
Q'ty at Location: 10 EACH Estimated Cost : 0
Replacement Q'ty: 0 EACH

Year Installed : 1970 Year of Last Insp.: 0 Life w/ Repair : 5 Life w/o Repair :

Urgency : REPAIR IMMEDIATELY Condition: FAIL <100% Imp'tce : PRIMARY
Status : Service : CONTINUOUS Access :
Rep.Task: Rep.Cause: Rep.Sympt:

Purpose
MAINTENANCE

Survey IU Comments Comment Types
Note Log : VENT PANEL DOOR SEALS ARE LOST SURVEY INFO
Photo Log :
Sketch Log:

Deficiency Group	Deficiency	Coverage (%)	Light	Moderate	Severe	Fail	NSIP
ELEC;DISCONNECT	ENCLOSURE: IMPROPER, CORRODED, NOT SE-CURED, PHYSICALLY DAMAGED Etc.						100 N

Component : ELEC;DISCONNECT Location: 2 VENT CONT PNL SIZE 2 STARTER
Type : SWIT; CONT; 125-200A; SZ 4 SWIT; CONT; 125-200A; SZ 4

Floor : Room: Equipment ID :
Q'ty at Location: 1 EACH Estimated Cost : 0
Replacement Q'ty: 0 EACH

Year Installed : 1970 Year of Last Insp.: 0 Life w/ Repair : 10 Life w/o Repair : 1

Urgency : REPAIR IMMEDIATELY Condition: FAIR <25% Imp'tce : PRIMARY
Status : Service : CONTINUOUS Access :
Rep.Task: Rep.Cause: Rep.Sympt:

Purpose
MAINTENANCE

COMPLETE SURVEY DETAIL

Survey IU Comments	Comment Types
Note Log :	THE CONDITION OF THE OPERATING COIL OF
Photo Log :	THE NEMA SIZE 2 STARTER IS QUESTIONABLE.
Sketch Log:	DISCOLORED AND CRACKED COIL ENCASMENT
	INDICATES SERIOUS HEATING IN THE PAST

Deficiency Group	Deficiency	Coverage (%)					
		Light	Moderate	Severe	Fail	NSIP	
ELEC;DISCONNECT	CONTROL WIRING: IMPROPER INSTALLATION, INDICATORS NOT WORKING/OBSCURED Etc.					70	N

Component : ELEC;DISCONNECT Location: 3 VENT PNL DIRT/WATER DAMAGE
Type : SWIT; CONT; 125-200A; SZ 4 SWIT; CONT; 125-200A; SZ 4

Floor : Room: Equipment ID :
Q'ty at Location: 1 EACH Estimated Cost : 0
Replacement Q'ty: 0 EACH

Year Installed : 1970 Year of Last Insp.: 0 Life w/ Repair : 15 Life w/o Repair : 5

Urgency : REPAIR IMMEDIATELY Condition: POOR <60% Imp'tce : PRIMARY
Status : Service : CONTINUOUS Access :
Rep.Task: Rep.Cause: Rep.Sympt:

Purpose
CODE VIOLATION
MAINTENANCE

Survey IU Comments	Comment Types
Note Log : THERE IS SO MUCH DIRT IN THIS VENT	SURVEY INFO
Photo Log : CONTROL BOX, THAT IT IS AMAZING THAT	
Sketch Log: ANY COMPONENTS WILL FUNCTION PROPERLY.	
THE COST OF DISASSEMBLY OF THE CONTACTOR	
S FOR CLEANING ETC. THROUGHOUT	
WOULD BE COSTLY. MORE COST EFFECTIVE TO	
REPLACE.	

Deficiency Group	Deficiency	Coverage (%)					Fail	NSIP
		Light	Moderate	Severe				
ELEC;DISCONNECT	ENCLOSURE: IMPROPER, CORRODED, NOT SECURED, PHYSICALLY DAMAGED Etc.						80	N

16-NOV-95

CONDITION ASSESSMENT INFORMATION SYSTEM
Westinghouse Hanford Co.

Page 4 of 7

COMPLETE SURVEY DETAIL

Component : ELEC;TRANSFER SWITCHES Location: 1 BOX W/TIME DELAY RELAYS & SWS
 Type : TRANS SWIT;120-480V; 30 AMPS; 1-3 P TRANS SWIT;120-480V; 30 AMPS; 1-3 P

Floor : Room: Equipment ID :
 Q'ty at Location: 2 EACH Estimated Cost : 0
 Replacement Q'ty: 0 EACH

Year Installed : 1970 Year of Last Insp.: 0 Life w/ Repair : 20 Life w/o Repair :

Urgency : REPAIR IMMEDIATELY Condition: FAIL <100% Imp'tce : PRIMARY
 Status : Service : CONTINUOUS Access :
 Rep.Task: Rep.Cause: Rep.Sympt:

Purpose
 CODE VIOLATION
 MAINTENANCE
 FUNCT. IMPROVEMENT

Survey IU Comments Comment Types
 Note Log : THE BOX IS MOUNTED ON THE BACKSIDE OF SURVEY INFO
 Photo Log : THE VENT CONT PNL. NO ID, SEVERE RUST,
 Sketch Log: WIRE INSULATION CRACKED, WIRE TO TAUGHT.
 THIS BOX MUST BE REPLACED AND INTERIOR
 COMPONENTS PROPERLY REWIRED

Deficiency Group	Deficiency	Coverage (%)				
		Light	Moderate	Severe	Fail NSIP	
ELEC;TRANSFER SWITCHES	CONTROL WIRING: IMPROPER INSTALLATION, INDICATORS NOT WORKING/OBSCURED Etc.	100	N			
ELEC;TRANSFER SWITCHES	ENCLOSURE: IMPROPER, CORRODED, NOT SECURED, PHYSICALLY DAMAGED Etc.	100	N			
ELEC;TRANSFER SWITCHES	MARKING: IMPROPER, MISSING, ILLEGIBLE Etc.	100	N			

WBS : Elec;Spcl;Control Units Location: 1 Asset - Wide

16-NOV-95

CONDITION ASSESSMENT INFORMATION SYSTEM
Westinghouse Hanford Co.

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COMPLETE SURVEY DETAIL

Component : ELEC;CONTROL UNIT;ELEC;(ASSY) Location: 1 DELTA/TEMP CONTROL PANEL
Type : CONTROL UNIT; MULTI INDICAT; 10 INPUT CH CONTROL UNIT; MULTI INDICAT; 10 INPUT CH

Floor : Room: Equipment ID :
Q'ty at Location: 1 EACH Estimated Cost : 0
Replacement Q'ty: 0 EACH

Year Installed : 1970 Year of Last Insp.: 0 Life w/ Repair : 20 Life w/o Repair :

Urgency : REPAIR WITHIN 1 YEAR Condition: POOR <60% Imp'tce : PRIMARY
Status : Service : CONTINUOUS Access :
Rep.Task: Rep.Cause: Rep.Sympt:

Purpose
MAINTENANCE
CODE VIOLATION

Survey IU Comments Comment Types
Note Log : THIS CONTROL PANEL IS A MAINTENANCE SURVEY INFO
Photo Log : NIGHTMARE. NO MAINTENANCE CAN BE
Sketch Log: PERFORMED UNLESS ALL POWER IS REMOVED
AND THE ENTIRE PANEL DISASSEMBLED.

Deficiency Group	Deficiency	Coverage (%)				
		Light	Moderate	Severe	Fail NSIP	
ELEC;CONTROL UNITS	ENCLOSURE IMPROPER; CORRODED, RUSTED, NOT ACCESSIBLE, Etc.					100 N

Survey Asset : 241AY-0000 TANK FARM
Asset Class : BUILDINGS;GENERAL Use Code: Nuclear Waste Proces ADF : FULL CAS

Inspector : GILMOUR, GARY Discipline : Electrical

Survey Date : 23-AUG-95 Survey Time: 06:49:18 Survey Type: CAS
Survey Version : 95-FY Insp-CAIS Software Version: 1.200

WBS : Elec;Serv + Distrib;Low Voltage Distrib Location: 1 Asset - Wide

16-NOV-95

CONDITION ASSESSMENT INFORMATION SYSTEM
Westinghouse Hanford Co.

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COMPLETE SURVEY DETAIL

Component : ELEC;WIRES,CABLES,FITTINGS Location: 1 VENT PANEL 102
Type : TERM/SPLIC;CAB;SHLD AL;5KV;2/0-350kcm;EA TERM/SPLIC;CAB;SHLD AL;5KV;2/0-350kcm;EA

Floor : Room: Equipment ID :
Q'ty at Location: 3 LNFT Estimated Cost : 0
Replacement Q'ty: 0 LNFT

Year Installed : 1976 Year of Last Insp.: 0 Life w/ Repair : 15 Life w/o Repair :

Urgency : REPAIR IMMEDIATELY Condition: FAIL <100% Imp'tce : PRIMARY
Status : Service : CONTINUOUS Access :
Rep.Task: Rep.Cause: Rep.Sympt:

Purpose
MAINTENANCE
CODE VIOLATION
EFFICIENCY

Survey IU Comments Comment Types
Note Log : THE POWER CABLE HAS HAD NUMEROUS STRANDS SURVEY INFO
Photo Log : CUT FROM THE TOTAL CONDUCTOR TO FIT AN
Sketch Log: UNDER SIZED TERMINAL STRIP. AS WITH THE
FIRST VENT PANEL INSPECTED, THIS IS A SE
RIOUS VIOLATION OF THE NEC, AND MUST BE
CORRECTED IMMEDIATELY.

Note Log : THE 102 VENT PANEL IS IN THE SAME CONDIT SURVEY INFO
Photo Log : ION AS THE 101 VENT PANEL. THE REPLACEME
Sketch Log: NT OF BOTH IS HIGHLY RECOMMENDED.

Deficiency	Deficiency	Coverage (%)
Group		Light Moderate Severe Fail NSIP
ELEC;WIRES,CABLES,FITTINGS	INSTALLATION: IMPROPER; CONDUCTORS NOT ISOLATED, MARKED, JOINED; LOOSE Etc.	100 N

WBS : Elec;Spcl;Control Units Location: 1 Asset - Wide

16-NOV-95

CONDITION ASSESSMENT INFORMATION SYSTEM
Westinghouse Hanford Co.

Page 7 of 7

COMPLETE SURVEY DETAIL

Component : ELEC;CONTROL UNIT;ELEC;(ASSY) Location: 1 DELTA-T CONTROLLER / 102
Type : CONTROL UNIT; MULTI INDICAT; 10 INPUT CH CONTROL UNIT; MULTI INDICAT; 10 INPUT CH

Floor : Room: Equipment ID :
Q'ty at Location: 1 EACH Estimated Cost : 0
Replacement Q'ty: 0 EACH

Year Installed : 1970 Year of Last Insp.: 0 Life w/ Repair : Life w/o Repair :

Urgency : REPAIR WITHIN 1 YEAR Condition: POOR <60% Imp'tce : PRIMARY
Status : Service : CONTINUOUS Access :
Rep.Task: Rep.Cause: Rep.Sympt:

Purpose
MAINTENANCE
CODE VIOLATION

Survey IU Comments Comment Types
Note Log : THIS PANEL IS THE SAME AS THE CONTROLLER SURVEY INFO
Photo Log : FOR VENT PNL.101. DUE TO THE REQUIRED D
Sketch Log: ISASSEMBLY OF THE CONTROLLER TO PERFORM
MAINTENANCE, IT IS RECOMMENDED THAT IT B
E REPLACED.

Deficiency Group	Deficiency	Coverage (%)	Light	Moderate	Severe	Fail	NSIP
ELEC;CONTROL UNITS	ENCLOSURE IMPROPER; CORRODED, RUSTED, NOT ACCESSIBLE, Etc.	100	N				

CONDITION ASSESSMENT INFORMATION SYSTEM

Report : COMPLETE SURVEY DETAIL

Filename : RPTCSD.lis

Run by : CAIS12

Report Date : 16-NOV-1995 09:08

Parameters Entered

Survey Asset ID : 241AZ%

Survey Asset ID Suffix: %

Inspector ID : GMG

Survey Type : %

Survey Version : %

Discipline : %

16-NOV-95

CONDITION ASSESSMENT INFORMATION SYSTEM
Westinghouse Hanford Co.

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COMPLETE SURVEY DETAIL

Area : 13050 HANFORD

Site Asset: 241AZ-0000 WASTE DISPOSAL TANK FARM WASTE DISPOSAL

Survey Asset : 241AZ-0000 TANK FARM

Asset Class : BUILDINGS;GENERAL Use Code: Hazardous Production ADF : FULL CAS

Inspector : GILMOUR, GARY

Discipline : Electrical

Survey Date : 22-AUG-95

Survey Time: 12:06:45

Survey Type: CAS

Survey Version : 95-FY

Insp-CAIS Software Version: 1.200

WBS : Elec;Serv + Distrib;Low Voltage Distrib Location: 1 Asset - Wide

Component : ELEC;RACEWAYS,FITTINGS

Location: 1 AZ FARM ABOVE GROUND BOXES

Type : PULL/JUNCTION BOX; 18x18x8

PULL/JUNCTION BOX; 18x18x8

Floor : Room: Equipment ID :

Q'ty at Location: 30 LNFT Estimated Cost : 0

Replacement Q'ty: 0 LNFT

Year Installed : 1971

Year of Last Insp.: 0

Life w/ Repair :

Life w/o Repair :

Urgency : REPAIR WITHIN 1 YEAR

Condition: POOR <60%

Imp'tce : PRIMARY

Status :

Service : CONTINUOUS

Access :

Rep.Task:

Rep.Cause:

Rep.Sympt:

Purpose

MAINTENANCE

Survey IU Comments

Comment Types

Note Log : APPROX. HALF OF THE ENCLOSURES IN THE SURVEY INFO

Photo Log : FARM ARE BADLY RUSTED AND NEED CORRECTIV

Sketch Log: E MAINTENANCE NOW.

Deficiency

Coverage (%)

Group

Deficiency

Light Moderate Severe Fail NSIP

ELEC;RACEWAYS,FITTINGS,DEVICES

RACEWAY: IMPROPER FOR APPLICATION,

50

N

CORRODED, PHYSICAL DAMAGE Etc.

16-NOV-95

CONDITION ASSESSMENT INFORMATION SYSTEM
Westinghouse Hanford Co.

Page 2 of 4

COMPLETE SURVEY DETAIL

Component : ELEC;RACEWAYS,FITTINGS Location: 1 DOOR SEALS THROUGHOUT AZ FARM
Type : PULL/JUNCTION BOX; 20x20x8 PULL/JUNCTION BOX; 20x20x8

Floor : Room: EXT Equipment ID :
Q'ty at Location: 1 LNFT Estimated Cost : 0
Replacement Q'ty: 0 LNFT

Year Installed : 1971 Year of Last Insp.: 0 Life w/ Repair : Life w/o Repair :

Urgency : REPAIR WITHIN 1 YEAR Condition: POOR <60% Imp'tce : PRIMARY
Status : Service : CONTINUOUS Access :
Rep.Task: Rep.Cause: Rep.Sympt:

Purpose
MAINTENANCE

Survey IU Comments Comment Types
Note Log : DOOR SEALS ARE SEVERELY DETERIORATED OR SURVEY INFO
Photo Log : NONEXISTENT THROUGHOUT THE FARM.
Sketch Log:

Deficiency Group	Deficiency	Coverage (%)		
		Light Moderate Severe Fail NSIP		
ELEC;RACEWAYS,FITTINGS,DEVICES	RACEWAY: IMPROPER FOR APPLICATION, CORRODED, PHYSICAL DAMAGE Etc.		80	N

Component : ELEC;WIRES,CABLES,FITTINGS Location: 1 MCC 241-AZ-801A CUBICLE B4b
Type : CABLE; MI; #4-#8; 3 CONDUCTOR; 600V CABLE; MI; #4-#8; 3 CONDUCTOR; 600V

Floor : Room: Equipment ID :
Q'ty at Location: 12 LNFT Estimated Cost : 0
Replacement Q'ty: 0 LNFT

Year Installed : 1971 Year of Last Insp.: 0 Life w/ Repair : Life w/o Repair :

Urgency : REPAIR IMMEDIATELY Condition: FAIL <100% Imp'tce : PRIMARY
Status : Service : CONTINUOUS Access :
Rep.Task: Rep.Cause: Rep.Sympt:

Purpose
MAINTENANCE
CODE VIOLATION

COMPLETE SURVEY DETAIL

Survey IU Comments	Comment Types
Note Log :	THE LOAD LEADS HAVE BEEN DISCONNECTED
Photo Log :	FROM THE SUPPLY BREAKER AND ABANDONED
Sketch Log:	IN THE WIREWAY. THE LEADS ARE NOT TAPED
	OR MARKED, AND THE CUBICLE IS NOT TAGGED
	AS OUT OF SERVICE OR LOCKED OUT.

Deficiency Group	Deficiency	Coverage (%)					
		Light	Moderate	Severe	Fail	NSIP	
ELEC; WIRES, CABLES, FITTINGS	INSTALLATION: IMPROPER; CONDUCTORS NOT ISOLATED, MARKED, JOINED; LOOSE Etc.						100 N

Component : ELEC;MOTOR CONTROL CENTER;(ASSY) Location: 1 MCC 241-AZ-801A
Type : MCC;INCOM;2 VERT SECT;3-10KVA XFM;NE1-12 MCC;INCOM;2 VERT SECT;3-10KVA XFM;NE1-12

Floor :	Room: EXT	Equipment ID :
Q'ty at Location:	1 EACH	Estimated Cost : 0
Replacement Q'ty:	0 EACH	

Year Installed : 1971 Year of Last Insp.: 0 Life w/ Repair : Life w/o Repair :

Urgency : REPAIR WITHIN 1 YEAR	Condition: FAIR < 25%	Imp'tce : PRIMARY
Status :	Service : CONTINUOUS	Access :
Rep.Task:	Rep.Cause:	Rep.Sympt:

Purpose
MAINTENANCE
CODE VIOLATION

Survey IU Comments	Comment Types
Note Log :	THIS MCC HAS A GREAT DEAL OF DIRT AND SURVEY INFO
Photo Log :	DUST WITHIN. CLEANING IS PARAMOUNT
Sketch Log:	TO CONTINUED SERVICE.

Deficiency Group	Deficiency	Coverage (%)				
		Light	Moderate	Severe	Fail NSIP	
ELEC;MOTOR CONTROL CENTER;ASSY	ENCLOSURE: IMPROPER, CORRODED, NOT SE- CURED, PHYSICALLY DAMAGED Etc.					80

WBS : Elec;Lighting;Luminaires Location: 1 Asset - Wide

16-NOV-95

CONDITION ASSESSMENT INFORMATION SYSTEM
Westinghouse Hanford Co.

Page 4 of 4

COMPLETE SURVEY DETAIL

Component : ELEC; INTERIOR Location: 1 BLDG.801A EMERGENCY LIGHTS
Type : FIXTURE; EMERGENCY; LEAD BATT OPERATED FIXTURE; EMERGENCY; LEAD BATT OPERATED

Floor : Room: INT Equipment ID :
Q'ty at Location: 2 EACH Estimated Cost : 0
Replacement Q'ty: 0 EACH

Year Installed : 1971 Year of Last Insp.: 0 Life w/ Repair : Life w/o Repair :

Urgency : REPAIR IMMEDIATELY Condition: FAIL <100% Imp'tce : PRIMARY
Status : Service : EMERGENCY Access :
Rep.Task: Rep.Cause: Rep.Sympt:

Purpose
MAINTENANCE
CODE VIOLATION

Survey IU Comments Comment Types
Note Log : THE EMERGENCY LIGHTS ARE NOT CONNECTED SURVEY INFO
Photo Log : TO THE LIGHTING CIRCUIT AS REQUIRED.
Sketch Log:

Deficiency	Deficiency	Coverage (%)
Group		Light Moderate Severe Fail NSIP
ELEC;LIGHTING;FIXTURE ASSEMBLY	CONTROL MODULE: DEFECTIVE, LOOSE BOARDS/ WIRING, PHYSICALLY DAMAGED Etc.	100

N

CONDITION ASSESSMENT INFORMATION SYSTEM

Report : COMPLETE SURVEY DETAIL

Filename : RPTCSD.lis

Run by : CAIS12

Report Date : 16-NOV-1995 09:04

Parameters Entered

Survey Asset ID : 241AZ%

Survey Asset ID Suffix: %

Inspector ID : GMG

Survey Type : %

Survey Version : %

Discipline : %

WHC-SD-W314-ES-018, Rev 0

16-NOV-95

CONDITION ASSESSMENT INFORMATION SYSTEM
Westinghouse Hanford Co.

Page 1 of 4

COMPLETE SURVEY DETAIL

Area : 13050 HANFORD

Site Asset: 241AZ-0000 WASTE DISPOSAL TANK FARM WASTE DISPOSAL

Survey Asset : 241AZ-0000 TANK FARM

Asset Class : BUILDINGS;GENERAL Use Code: Hazardous Production ADF : FULL CAS

Inspector : GILMOUR, GARY

Discipline : Electrical

Survey Date : 22-AUG-95

Survey Time: 12:06:45

Survey Type: CAS

Survey Version : 95-FY

Insp-CAIS Software Version: 1.200

WBS : Elec;Serv + Distrib;Low Voltage Distrib Location: 1 Asset - Wide

Component : ELEC;RACEWAYS,FITTINGS

Location: 1 AZ FARM ABOVE GROUND BOXES

Type : PULL/JUNCTION BOX; 18x18x8

PULL/JUNCTION BOX; 18x18x8

Floor :

Room:

Equipment ID :

Q'ty at Location: 30 LNFT

Estimated Cost : 0

Replacement Q'ty: 0 LNFT

Year Installed : 1971

Year of Last Insp.: 0

Life w/ Repair :

Life w/o Repair :

Urgency : REPAIR WITHIN 1 YEAR

Condition: POOR <60%

Imp'tce : PRIMARY

Status :

Service : CONTINUOUS

Access :

Rep.Task:

Rep.Cause:

Rep.Sympt:

Purpose

MAINTENANCE

Survey IU Comments

Comment Types

Note Log : APPROX. HALF OF THE ENCLOSURES IN THE SURVEY INFO

Photo Log : FARM ARE BADLY RUSTED AND NEED CORRECTIV

Sketch Log: E MAINTENANCE NOW.

Deficiency

Coverage (%)

Group

Deficiency

Light Moderate Severe Fail NSIP

ELEC;RACEWAYS,FITTINGS,DEVICES

RACEWAY: IMPROPER FOR APPLICATION,

50

N

CORRODED, PHYSICAL DAMAGE Etc.

16-NOV-95

CONDITION ASSESSMENT INFORMATION SYSTEM
Westinghouse Hanford Co.

Page 2 of 4

COMPLETE SURVEY DETAIL

Component : ELEC;RACEWAYS,FITTINGS Location: 1 DOOR SEALS THROUGHOUT AZ FARM
Type : PULL/JUNCTION BOX; 20x20x8 PULL/JUNCTION BOX; 20x20x8

Floor : Room: EXT Equipment ID :
Q'ty at Location: 1 LNFT Estimated Cost : 0
Replacement Q'ty: 0 LNFT

Year Installed : 1971 Year of Last Insp.: 0 Life w/ Repair : Life w/o Repair :

Urgency : REPAIR WITHIN 1 YEAR Condition: POOR <60% Imp'tce : PRIMARY
Status : Service : CONTINUOUS Access :
Rep.Task: Rep.Cause: Rep.Sympt:

Purpose
MAINTENANCE

Survey IU Comments Comment Types
Note Log : DOOR SEALS ARE SEVERELY DETERIORATED OR SURVEY INFO
Photo Log : NONEXISTENT THROUGHOUT THE FARM.
Sketch Log:

Deficiency Group	Deficiency	Coverage (%)				Fail	NSIP
		Light	Moderate	Severe			
ELEC;RACEWAYS,FITTINGS,DEVICES	RACEWAY: IMPROPER FOR APPLICATION, CORRODED, PHYSICAL DAMAGE Etc.	80					N

Component : ELEC;WIRES,CABLES,FITTINGS Location: 1 MCC 241-AZ-801A CUBICLE B4b
Type : CABLE; MI; #4-#8; 3 CONDUCTOR; 600V CABLE; MI; #4-#8; 3 CONDUCTOR; 600V

Floor : Room: Equipment ID :
Q'ty at Location: 12 LNFT Estimated Cost : 0
Replacement Q'ty: 0 LNFT

Year Installed : 1971 Year of Last Insp.: 0 Life w/ Repair : Life w/o Repair :

Urgency : REPAIR IMMEDIATELY Condition: FAIL <100% Imp'tce : PRIMARY
Status : Service : CONTINUOUS Access :
Rep.Task: Rep.Cause: Rep.Sympt:

Purpose
MAINTENANCE
CODE VIOLATION

16-NOV-95

CONDITION ASSESSMENT INFORMATION SYSTEM
Westinghouse Hanford Co.

Page 3 of 4

COMPLETE SURVEY DETAIL

Survey IU Comments	Comment Types
Note Log : THE LOAD LEADS HAVE BEEN DISCONNECTED	SURVEY INFO
Photo Log : FROM THE SUPPLY BREAKER AND ABANDONED	
Sketch Log: IN THE WIREWAY. THE LEADS ARE NOT TAPED	
OR MARKED, AND THE CUBICLE IS NOT TAGGED	
AS OUT OF SERVICE OR LOCKED OUT.	

Deficiency Group	Deficiency	Coverage (%)	Light	Moderate	Severe	Fail	NSIP
ELEC;WIRES,CABLES,FITTINGS	INSTALLATION: IMPROPER; CONDUCTORS NOT ISOLATED, MARKED, JOINED; LOOSE Etc.	100					N

Component : ELEC;MOTOR CONTROL CENTER;(ASSY) Location: 1 MCC 241-AZ-801A
 Type : MCC;INCOM;2 VERT SECT;3-10KVA XFM;NE1-12 MCC;INCOM;2 VERT SECT;3-10KVA XFM;NE1-12

Floor : Room: EXT Equipment ID :
 Q'ty at Location: 1 EACH Estimated Cost : 0
 Replacement Q'ty: 0 EACH

Year Installed : 1971 Year of Last Insp.: 0 Life w/ Repair : Life w/o Repair :

Urgency : REPAIR WITHIN 1 YEAR Condition: FAIR < 25% Imp'tce : PRIMARY
 Status : Service : CONTINUOUS Access :
 Rep.Task: Rep.Cause: Rep.Sympt:

Purpose
 MAINTENANCE
 CODE VIOLATION

Survey IU Comments	Comment Types
Note Log : THIS MCC HAS A GREAT DEAL OF DIRT AND	SURVEY INFO
Photo Log : DUST WITHIN. CLEANING IS PARAMOUNT	
Sketch Log: TO CONTINUED SERVICE.	

Deficiency Group	Deficiency	Coverage (%)	Light	Moderate	Severe	Fail	NSIP
ELEC;MOTOR CONTROL CENTER;(ASSY)	ENCLOSURE: IMPROPER, CORRODED, NOT SE- CURED, PHYSICALLY DAMAGED Etc.	80					N

WBS : Elec;Lighting;Luminaires Location: 1 Asset - Wide

16-NOV-95

CONDITION ASSESSMENT INFORMATION SYSTEM
Westinghouse Hanford Co.

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COMPLETE SURVEY DETAIL

Component : ELEC; INTERIOR Location: 1 BLDG.801A EMERGENCY LIGHTS
Type : FIXTURE; EMERGENCY; LEAD BATT OPERATED FIXTURE; EMERGENCY; LEAD BATT OPERATED

Floor : Room: INT Equipment ID :
Q'ty at Location: 2 EACH Estimated Cost : 0
Replacement Q'ty: 0 EACH

Year Installed : 1971 Year of Last Insp.: 0 Life w/ Repair : Life w/o Repair :

Urgency : REPAIR IMMEDIATELY Condition: FAIL <100% Imp'tce : PRIMARY
Status : Service : EMERGENCY Access :
Rep.Task: Rep.Cause: Rep.Sympt:

Purpose
MAINTENANCE
CODE VIOLATION

Survey IU Comments Comment Types
Note Log : THE EMERGENCY LIGHTS ARE NOT CONNECTED SURVEY INFO
Photo Log : TO THE LIGHTING CIRCUIT AS REQUIRED.
Sketch Log:

Deficiency	Deficiency	Coverage (%)	
Group		Light Moderate Severe Fail NSIP	
ELEC;LIGHTING;FIXTURE ASSEMBLY	CONTROL MODULE: DEFECTIVE, LOOSE BOARDS/ WIRING, PHYSICALLY DAMAGED Etc.		100

N

CONDITION ASSESSMENT INFORMATION SYSTEM

Report : COMPLETE SURVEY DETAIL

Filename : RPTCSD.lis

Run by : CAIS12

Report Date : 16-NOV-1995 09:04

Parameters Entered

Survey Asset ID : 241AZ%

Survey Asset ID Suffix: %

Inspector ID : GMG

Survey Type : %

Survey Version : %

Discipline : %

WHC-SD-W314-ES-018, Rev 0

16-NOV-95

CONDITION ASSESSMENT INFORMATION SYSTEM
Westinghouse Hanford Co.

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COMPLETE SURVEY DETAIL

Area : 13050 HANFORD

Site Asset: 241AZ-0000 WASTE DISPOSAL TANK FARM WASTE DISPOSAL

Survey Asset : 241AZ-0000 TANK FARM

Asset Class : BUILDINGS;GENERAL Use Code: Hazardous Production ADF : FULL CAS

Inspector : GILMOUR, GARY

Discipline : Electrical

Survey Date : 22-AUG-95

Survey Time: 12:06:45

Survey Type: CAS

Survey Version : 95-FY

Insp-CAIS Software Version: 1.200

WBS : Elec;Serv + Distrib;Low Voltage Distrib Location: 1 Asset - Wide

Component : ELEC;RACEWAYS,FITTINGS

Location: 1 AZ FARM ABOVE GROUND BOXES

Type : PULL/JUNCTION BOX; 18x18x8

PULL/JUNCTION BOX; 18x18x8

Floor : Room:

Equipment ID :

Q'ty at Location: 30 LNFT

Estimated Cost : 0

Replacement Q'ty: 0 LNFT

Year Installed : 1971

Year of Last Insp.: 0

Life w/ Repair :

Life w/o Repair :

Urgency : REPAIR WITHIN 1 YEAR

Condition: POOR <60%

Imp'tce : PRIMARY

Status :

Service : CONTINUOUS

Access :

Rep.Task:

Rep.Cause:

Rep.Sympt:

Purpose

MAINTENANCE

Survey IU Comments

Comment Types

Note Log : APPROX. HALF OF THE ENCLOSURES IN THE SURVEY INFO

Photo Log : FARM ARE BADLY RUSTED AND NEED CORRECTIV

Sketch Log: E MAINTENANCE NOW.

Deficiency

Coverage (%)

Group

Deficiency

Light Moderate Severe Fail NSIP

ELEC;RACEWAYS,FITTINGS,DEVICES RACEWAY: IMPROPER FOR APPLICATION,

50

N

CORRODED, PHYSICAL DAMAGE Etc.

16-NOV-95

CONDITION ASSESSMENT INFORMATION SYSTEM
Westinghouse Hanford Co.

Page 2 of 4

COMPLETE SURVEY DETAIL

Component : ELEC;RACEWAYS,FITTINGS Location: 1 DOOR SEALS THROUGHOUT AZ FARM
Type : PULL/JUNCTION BOX; 20x20x8 PULL/JUNCTION BOX; 20x20x8

Floor : Room: EXT Equipment ID :
Q'ty at Location: 1 LNFT Estimated Cost : 0
Replacement Q'ty: 0 LNFT

Year Installed : 1971 Year of Last Insp.: 0 Life w/ Repair : Life w/o Repair :

Urgency : REPAIR WITHIN 1 YEAR Condition: POOR <60% Imp'tce : PRIMARY
Status : Service : CONTINUOUS Access :
Rep.Task: Rep.Cause: Rep.Sympt:

Purpose
MAINTENANCE

Survey IU Comments Comment Types
Note Log : DOOR SEALS ARE SEVERELY DETERIORATED OR SURVEY INFO
Photo Log : NONEXISTENT THROUGHOUT THE FARM.
Sketch Log:

Deficiency Group	Deficiency	Coverage (%)				Fail NSIP	80	N
		Light	Moderate	Severe				
ELEC;RACEWAYS,FITTINGS,DEVICES	RACEWAY: IMPROPER FOR APPLICATION, CORRODED, PHYSICAL DAMAGE Etc.							

Component : ELEC;WIRES,CABLES,FITTINGS Location: 1 MCC 241-AZ-801A CUBICLE B4b
Type : CABLE; MI; #4-#8; 3 CONDUCTOR; 600V CABLE; MI; #4-#8; 3 CONDUCTOR; 600V

Floor : Room: Equipment ID :
Q'ty at Location: 12 LNFT Estimated Cost : 0
Replacement Q'ty: 0 LNFT

Year Installed : 1971 Year of Last Insp.: 0 Life w/ Repair : Life w/o Repair :

Urgency : REPAIR IMMEDIATELY Condition: FAIL <100% Imp'tce : PRIMARY
Status : Service : CONTINUOUS Access :
Rep.Task: Rep.Cause: Rep.Sympt:

Purpose
MAINTENANCE
CODE VIOLATION

16-NOV-95

CONDITION ASSESSMENT INFORMATION SYSTEM
Westinghouse Hanford Co.

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COMPLETE SURVEY DETAIL

Survey IU Comments	Comment Types
Note Log : THE LOAD LEADS HAVE BEEN DISCONNECTED	SURVEY INFO
Photo Log : FROM THE SUPPLY BREAKER AND ABANDONED	
Sketch Log: IN THE WIREWAY. THE LEADS ARE NOT TAPED	
OR MARKED, AND THE CUBICLE IS NOT TAGGED	
AS OUT OF SERVICE OR LOCKED OUT.	

Deficiency Group	Deficiency	Coverage (%)	Light	Moderate	Severe	Fail	NSIP
ELEC;WIRES,CABLES,FITTINGS	INSTALLATION: IMPROPER; CONDUCTORS NOT ISOLATED, MARKED, JOINED; LOOSE Etc.	100	N				

Component : ELEC;MOTOR CONTROL CENTER;(ASSY) Location: 1 MCC 241-AZ-801A
Type : MCC;INCOM;2 VERT SECT;3-10KVA XFM;NE1-12 MCC;INCOM;2 VERT SECT;3-10KVA XFM;NE1-12

Floor : Room: EXT Equipment ID :
Q'ty at Location: 1 EACH Estimated Cost : 0
Replacement Q'ty: 0 EACH

Year Installed : 1971 Year of Last Insp.: 0 Life w/ Repair : Life w/o Repair :

Urgency : REPAIR WITHIN 1 YEAR Condition: FAIR < 25% Imp'tce : PRIMARY
Status : Service : CONTINUOUS Access :
Rep.Task: Rep.Cause: Rep.Sympt:

Purpose
MAINTENANCE
CODE VIOLATION

Survey IU Comments	Comment Types
Note Log : THIS MCC HAS A GREAT DEAL OF DIRT AND	SURVEY INFO
Photo Log : DUST WITHIN. CLEANING IS PARAMOUNT	
Sketch Log: TO CONTINUED SERVICE.	

Deficiency Group	Deficiency	Coverage (%)	Light	Moderate	Severe	Fail	NSIP
ELEC;MOTOR CONTROL CENTER;(ASSY)	ENCLOSURE: IMPROPER, CORRODED, NOT SE- CURED, PHYSICALLY DAMAGED Etc.	80	N				

WBS : Elec;Lighting;Luminaires Location: 1 Asset - Wide

16-NOV-95

CONDITION ASSESSMENT INFORMATION SYSTEM
Westinghouse Hanford Co.

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COMPLETE SURVEY DETAIL

Component : ELEC; INTERIOR Location: 1 BLDG.801A EMERGENCY LIGHTS
 Type : FIXTURE; EMERGENCY; LEAD BATT OPERATED FIXTURE; EMERGENCY; LEAD BATT OPERATED

Floor : Room: INT Equipment ID :
 Q'ty at Location: 2 EACH Estimated Cost : 0
 Replacement Q'ty: 0 EACH

Year Installed : 1971 Year of Last Insp.: 0 Life w/ Repair : Life w/o Repair :

Urgency : REPAIR IMMEDIATELY Condition: FAIL <100% Imp'tce : PRIMARY
 Status : Service : EMERGENCY Access :
 Rep.Task: Rep.Cause: Rep.Sympt:

Purpose
 MAINTENANCE
 CODE VIOLATION

Survey IU Comments Comment Types
 Note Log : THE EMERGENCY LIGHTS ARE NOT CONNECTED SURVEY INFO
 Photo Log : TO THE LIGHTING CIRCUIT AS REQUIRED.
 Sketch Log:

Deficiency	Deficiency	Coverage (%)
Group		Light Moderate Severe Fail NSIP
ELEC;LIGHTING;FIXTURE ASSEMBLY	CONTROL MODULE: DEFECTIVE, LOOSE BOARDS/ WIRING, PHYSICALLY DAMAGED Etc.	100

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To	From	Page 1 of 1
Distribution List	Instrument Systems Integration	Date 01/16/96
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