JUN 14 1996
Sta. 4 50

ENGINEERING DATA TRANSMITTAL

Page 1 of 1

1. EDT

Nº 614282

2. To: (Receiving Organization) Tank Farm Transition Projects		3. From: (Originating Organization) Transition Projects Integration Program		4. Related EDT No.: N/A				
5. Proj./Prog./Dept./Div.: Tank Farm Transition Projects		6. Cog. Engr.: R.W. Jacobson		7. Purchase Order No.: N/A				
8. Originator Remarks: Document is being issued for approval and release.				9. Equip./Component No.: N/A				
				10. System/Bldg./Facility: N/A				
11. Receiver Remarks:				12. Major Assm. Dwg. No.: N/A				
				13. Permit/Permit Application No.: N/A				
				14. Required Response Date: N/A				
15. DATA TRANSMITTED					(F)	(G)	(H)	(I)
(A) Item No.	(B) Document/Drawing No.	(C) Sheet No.	(D) Rev. No.	(E) Title or Description of Data Transmitted	Approval Designator	Reason for Trans- mittal	Originator Dispo- sition	Receiver Dispo- sition
1	WHC-SD-W314-ES-023		0	Tank Farm Restoration and Safe Operations, Project W-314; Facility Assessment Summary Report	N/A	2		

KEY					
Approval Designator (F)	Reason for Transmittal (G)			Disposition (H) & (I)	
E, S, C, D or N/A (see WHC-CM-3-5, Sec. 12.7)	1. Approval	4. Review		1. Approved	4. Reviewed no/comment
	2. Release	5. Post-Review		2. Approved w/comment	5. Reviewed w/comment
	3. Information	6. Dist. (Receipt Acknow. Required)		3. Disapproved w/comment	6. Receipt acknowledged

(G)	(H)	17. SIGNATURE/DISTRIBUTION (See Approval Designator for required signatures)								(G)	(H)
Reason	Disp.	(J) Name	(K) Signature	(L) Date	(M) MSIN	(J) Name	(K) Signature	(L) Date	(M) MSIN	Reason	Disp.
1	1	Cog. Eng. R. W. Jacobson		4/10/96	R1-09	W. W. Rutherford		4/10/96	R3-25	3
1	1	Cog. Mgr. R. L. Nelson		4/10/96	R2-54	C. C. Shipley		4/10/96	R1-09	3
1		F. Strankmen			R2-50	J. A. Hubbard			R1-09	3

18.	19.	20.	21. DOE APPROVAL (if required) Ctrl. No.
Signature of EDT Originator	Date _____ Authorized Representative _____ Date _____ for Receiving Organization	Cognizant Manager _____ Date _____	☐ Approved ☐ Approved w/comments ☐ Disapproved w/comments

Facility Assessment Summary Report for Project W-314, Tank Farm Restoration and Safe Operations

R. W. (Jake) Jacobson

Westinghouse Hanford Company, Richland, WA 99352

U.S. Department of Energy Contract DE-AC06-87RL10930

EDT/ECN: 614282

Org Code: 778A0

B&R Code:

UC:

Charge Code: N14PG

Total Pages: *19 KMB 6/13/96*

Key Words: The Tank Waste Remediation Systems (TWRS), Project W-314, Facility Assessment Summary Report (FASR)

Abstract: The Facility Assessment Summary Report (FASR) is a key element in the systems engineering document hierarchy, and provides an evaluation overview of the physical conditions and requirements for upgrading facility systems, subsystems, and/or components (SSC). This Project W-314 FASR was prepared to address the evaluations, inspections, and assessments conducted on the Tank Farm facilities associated with the preliminary Project W-314 scope, and to provide requirements for specifying necessary upgrades.

TRADEMARK DISCLAIMER. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof or its contractors or subcontractors.

Printed in the United States of America. To obtain copies of this document, contact: WHC/BCS Document Control Services, P.O. Box 1970, Mailstop H6-08, Richland WA 99352, Phone (509) 372-2420; Fax (509) 376-4989.

Release Approval

6/13/96
Date

Release Stamp

Approved for Public Release

PROJECT W-314

**FACILITY ASSESSMENT
SUMMARY REPORT**

REVISION 0
November 1, 1995

**TANK FARM RESTORATION
AND SAFE OPERATIONS (TFRSO)**

PROJECT W-314
FACILITY ASSESSMENT SUMMARY REPORT

REVISION 0
November 1, 1995

Prepared by:

Westinghouse Hanford Company
Post Office Box 1970
Richland, Washington 99352

Approved by: _____
(WHC)

Date: _____

Approved by: _____
(WHC)

Date: _____

**TFRSO PROJECT W-314
FACILITY ASSESSMENT SUMMARY REPORT**

EXECUTIVE SUMMARY

The Facility Assessment Summary Report (FASR) is a key element in the systems engineering document hierarchy, and provides an evaluation overview of the physical conditions and requirements for upgrading facility systems, subsystems, and/or components (SSC). This Project W-314 FASR was prepared to address the evaluations, inspections, and assessments conducted on the Tank Farm facilities to establish the preliminary Project W-314 scope, and to provide requirements for necessary upgrades. The Project W-314 FASR was included in the project baseline as a key element of the Project W-314 Decision Point Review No. 1 (DPR #1). This Project W-314 FASR is divided into the following sections:

- Section 1.0, Introduction, provides general information on how and why the FASR was conducted, and the background information used to establish the scope, and establishes the basis of how the FASR fits into the document hierarchy ;
- Section 2.0, Initial Assessment Overview, provides an overview of the Project W-314 initial assessments, which are divided into two sections (Hardware and Scoping/Validation);
- Section 3.0, Analysis of Facility Assessments, describes the assessment process documentation; and
- Section 4.0, Summary and Conclusions, summarizes the FASR and provides itemized conclusions.
- Section 5.0, References, provides a list of references used for the FASR.

**TFRS PROJECT W-314
FACILITY ASSESSMENT SUMMARY REPORT**

TABLE OF CONTENTS

1.0 INTRODUCTION	1-1
1.1 BACKGROUND AND OVERVIEW	1-1
1.2 SCOPE AND PURPOSE	1-1
1.3 DOCUMENT INTERFACES	1-2
2.0 INITIAL ASSESSMENT PROCESS	2-1
2.1 INITIAL ASSESSMENT PROCESS	2-1
2.2 ASSUMPTIONS AND CONSTRAINTS	2-2
2.3 ASSESSMENT TECHNIQUES AND CRITERIA	2-2
2.4 HARDWARE ASSESSMENT	2-3
2.4.1 Existing Architecture Determination	2-4
2.4.2 Compliance with Requirements and/or Constraints	2-4
2.4.3 System Performance	2-4
2.4.3.1 Inspection Activities	2-5
2.4.3.2 Field Assessment Questionnaire Table	2-5
2.4.3.3 Special Testing Activities	2-5
2.5 SCOPING/VALIDATION ASSESSMENT	2-5
2.5.1 Engineering Approach	2-6
2.5.2 Prioritization of Candidate Items	2-6
2.5.3 Priority List/Matrix	2-6
2.5.4 Definition of Required Work	2-6
3.0 ANALYSIS OF THE FACILITY ASSESSMENTS	3-1
3.1 ENGINEERING ANALYSIS	3-1
3.2 SYSTEM ARCHITECTURE TREE BLOCK DIAGRAM	3-1
3.3 PRELIMINARY DESIGN REQUIREMENTS DOCUMENT CROSS-REFERENCE TABLE	3-1
3.4 FUNCTIONS ASSESSMENT TABLE	3-2
3.5 SYSTEM DRAWING REFERENCES TABLE	3-2
3.6 FIELD ASSESSMENT QUESTIONNAIRE AND FINDINGS	3-2
3.7 CONDITION ASSESSMENT SURVEY NARRATIVES AND DETAILS	3-2
3.8 SPECIAL TESTING	3-2
4.0 SUMMARY AND CONCLUSIONS	4-1
4.1 SUMMARY OF THE FACILITY ASSESSMENT SUMMARY REPORT EFFORT	4-1
4.2 CONCLUSIONS	4-1
5.0 REFERENCES	5-1

FIGURES

1-1. Facility Assessment Summary Report Document Interfaces	1-2
2-1. Project W-314 Scope Identification Process	2-1
2-2. Process for the Sorting, Validating, and Prioritizing Project W-314 Activities	2-7

ACRONYMS

ALARA	As Low As Reasonably Achievable
CAIS	Condition Assessment Information System
CAMP	Capital Asset Management Process
CAS	Condition Assessment Survey
DOE-RL	U.S. Department of Energy, Richland Operations Office
DPR	Decision Point Review
FASR	Facility Assessment Summary Report
SSC	Systems, Subsystems, and/or Components
TFRSO	Tank Farm Restoration and Safe Operations
TWRS	Tank Waste Remediation System
WHC	Westinghouse Hanford Company

TFRSO PROJECT W-314 FACILITY ASSESSMENT SUMMARY REPORT

1.0 INTRODUCTION

1.1 BACKGROUND AND OVERVIEW

The mission of the Tank Waste Remediation System (TWRS) program is to store, treat, and immobilize highly radioactive tank waste in an environmentally sound, safe, and cost-effective manner. Within the TWRS program, the Tank Farm Restoration and Safe Operations (TFRSO) Project W-314, a Major Systems Acquisition project, will provide upgrades to instrumentation and control, tank ventilation, waste transfer, and electrical distribution for existing tank farm facilities. This project has completed the pre-conceptual design phase and has received 'Key Decision 0' authorization to proceed with the next project phase.

The Project W-314 purpose is to restore and/or upgrade existing Tank Farm facilities and systems to ensure that the Hanford Site Tank Farm infrastructure will be able to support safe, near-term storage and subsequent retrieval for treatment and disposal of liquid wastes. Capital improvements provided by this project will increase the margin of safety for Tank Farm operations, and will aid in aligning affected Tank Farm systems with compliance requirements from applicable, state, Federal, and local regulations. Secondary benefits will be realized subsequent to project completion in the form of reduced equipment down-time; reduced health and safety risks to occupational workers; minimization of environmental exposure to radioactive and/or hazardous material releases; and reduced operating costs.

1.2 SCOPE AND PURPOSE

As stated in the *Systems Engineering, Statement of Work (SE-SOW) Approach Review for Project W-314, Tank Farm Restoration and Safe Operations* (WHC 1995a), the Project W-314 Facility Assessment Summary Report (FASR) should be:

"... a summary of the methodology and conclusions arrived at from the Tank Farm assessment activity."

In accordance with the SE-SOW (WHC 1995a) this FASR was prepared as a requirement for the completion of Decision Point Review No. 1 (DPR #1).

The DPR #1 objective is to determine whether sufficient facility assessments existed on which to base a master plan for Tank Farms; and to substantiate and document this process. Future assessments will be defined by the master planning process being developed. As such, the FASR serves to substantiate and document the initial facility assessment process. The DPR #1 review will determine whether the methodology of the assessment meets that criterion.

The Project W-314 FASR was prepared to provide a process for evaluation of the tank farm infrastructure, using data obtained from prior documentation. The effort is intended to determine the systems, subsystems, and/or components (SSCs) that must be fixed, within the boundaries of the current working draft of the *Preliminary Design Requirements Document* (PDRD) (WHC 1995b). The FASR was prepared as a summarized report that documents the process

used to determine SSC acceptability or deficiency status during initial assessments. This report will be used by the *Project W-314 Upgrades Scope Summary Report (USSR)* (WHC 1996) to determine the work that will remain in the preliminary Project W-314 scope.

1.3 DOCUMENT INTERFACES

The FASR provides a key link between data that describes the existing conditions and the work scope for required upgrades. Input documents include (among others) the *Project W-314 Mission Analysis Report* (WHC 1993), Condition Assessment Surveys, and the PDRD. The FASR results are documented in the following initial assessments:

- *Project W-314 Double-Shell Tank and Double-Container Receiver Tank Instrumentation and Control Systems, Initial Assessment* (WHC 1995c);
- *Double-Shell Tank and Double-Container Receiver Tank Rank Farm Electrical Distribution Systems Initial Assessment* (WHC 1995d);
- *Project W-314 Double-Shell Tank and Double-Container Receiver Tank Initial Assessment Report for Mechanical Systems Upgrade* (WHC 1995e); and
- *Project W-314 Double-Shell Tank and Double-Container Receiver Tank Initial Assessment Report, HVAC Systems* (WHC 1995f).

The FASR results are used as the basis to develop the USSR. The USSR is the deliverable used to satisfy the DPR #2.

The document interface network is depicted in Figure 1-1.

Figure 1-1. Facility Assessment Summary Report Document Interfaces.

2.0 INITIAL ASSESSMENT PROCESS

The initial assessments conducted for the TFRSO Project W-314 provided the information used as the FASR basis. The initial assessments defined in the SE-SOW included walkdowns of the pertinent facilities, interviews, studies, and evaluations, as necessary, to define the existing conditions and requirements for upgrades (a list of the initial assessments is provided in Section 1.3 of this document).

2.1 INITIAL ASSESSMENT PROCESS

The initial assessment objectives were to determine if the functionality of existing systems is sufficient to fulfill requirements defined in the 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 a duration of 30 years.

The initial assessments scope is based on the logic provided in Figure 2-1.

Figure 2-1. Project W-314 Scope Identification Process.

The PDRD was developed by a process of rigorous systems engineering analysis. The PDRD was intended to be traceable up to the functional decomposition of the *Tank Waste Remediation System Functions and Requirements Document* (DOE 1992) which is being developed in parallel. The following engineering studies were used as input to this development:

- Instrumentation and Controls--*Instrumentation and Controls Systems Engineering Study for Project W-314* (WHC 1994a);
- Electrical Systems--*Tank Farm Electrical Upgrades Engineering Study* (WHC 1994b);
- Piping Systems--*Transfer System Upgrades Engineering Study* (WHC 1994c); and
- Ventilation Systems--*Double-Shell Tank Ventilation Systems Upgrade Engineering Study* (WHC 1994d).

2.2 ASSUMPTIONS AND CONSTRAINTS

To bound the initial assessment and to define the process input and output, the condition assessment survey (CAS) staff worked within a group of assumptions and constraints. The most important assumption was that the PDRD requirements were to be considered a valid basis for CAS activities. Other assumptions and constraints listed in the FASR source documents were considered to be valid for this assessment, and can be reviewed in the text of these documents (see Figure 1-1).

2.3 ASSESSMENT TECHNIQUES AND CRITERIA

The initial assessments involved reviews of selected criteria required to establish the existing state and condition of selected tank farm systems; and also provided an evaluation of the requirements that exist for these systems and the degree of compliance under existing conditions. The selected criteria used for initial assessments are outlined in the *Tank Waste Remediation System Administration Manual*, Section 1.2, Identify, Validate, and Prioritize Activities (WHC 1995g). The techniques and criteria used for these assessments included:

1. Constraints--Externally applied conditions and requirements (e.g., regulatory commitments, OSHA regulations, stakeholder restrictions, etc.);
2. Performance Requirements--Operational requirements specified by Westinghouse Hanford Company (WHC) and/or the U.S. Department of Energy, Richland Operations Office (DOE-RL), including technical requirements, operational specifications, and functional parameters;
3. Operation Observations--Feedback from interviews, conversations, and meetings with key personnel (e.g., instrumentation technicians, health physics technicians, field engineers, etc.), which were used with varying levels of documentation to support the meetings and resulting requirements;
4. Engineering/Design Input--Review of drawings, specifications, design criteria, and other engineering and design source materials;
5. Field Assessments--Field inspections (based on the *TWRS Administration Manual*, Section 1.2, Identify, Validate, and Prioritize Activities) to document and describe field issues and conditions;

6. Engineering Studies--Support documents for specification of processes in the four main areas of the assessment (the PDRD was developed, in part, based on these studies);
7. Integrity Assessment/Failure Data--Data for operational integrity and failure analysis (e.g., HVAC systems integrity), using physical inspection data; and
8. Operating Costs--Evaluation of year-to-year (annual) costs, including the costs of doing business and routine operations, and life-cycle costing.

The assessments were divided into two phases, a Hardware Assessment; and a Scoping/Validation Assessment.

2.4 HARDWARE ASSESSMENT

The hardware assessment provided an evaluation of the ability of existing systems to meet the baseline system requirements identified in the PDRD; and included a summary of each system's actual performance. A team of four lead engineers (with respective expertise in the engineering fields of ventilation, electrical, mechanical, and instrumentation) was established to conduct the assessments. An independent validation of the resulting assessments will be addressed.

The assessments were guided by lines of inquiry to the requirements of the facility, relevant to the systems engineering aspects and functions of the facilities under investigation. Generalized questions were fundamental to the assessment, and addressed issues such as:

- What existing architecture, if any, is currently satisfying the PDRD requirements?
- Does the existing architecture comply with specified functionality and/or constraints?
- How well does the existing system meet the performance requirements specified in the PDRD?

Hierarchical Systems Architecture Trees (or specification trees) were developed for each of the major systems (e.g., ventilation, electrical, piping, and instrumentation and controls). The specification trees were used to define the system decomposition down to the subsystem and component levels; and to indicate the functional relationships. Based on the specification trees, appropriate requirements from the PDRD were assigned to the correlated system, subsystem, and/or components (see initial assessments, Section 1.3 of this document). Additional requirements (such as those identified since PDRD development) and other operational requirements were included, as appropriate.

Field inspections, using the CAS program, established a baseline of the physical condition of the existing plant architecture. Additional requirements to be assessed during field inspections were assigned to CAS inspectors as the needs became evident (e.g., inventory of equipment, verification of drawing configurations, etc.).

Using the field inspection results, the PDRD, and other technical requirement documents, the SSCs were evaluated to determine compliance with applicable requirements. Deficiencies were identified and evaluated with respect to safety and environmental constraints, operational requirements, physical condition, and the ability to support the Tank Farm mission. In the case where an entire system failed to meet a key criterion (such as a regulatory requirement), no

further assessment was performed at the lower (i.e., subsystem and/or component) levels. Deficiencies were documented in tables (see initial assessments, Section 1.3 of this document) that are linked to the specification trees.

The Hardware Assessment process involved a series of key review and evaluation efforts. These efforts are addressed in the following sections.

2.4.1 Existing Architecture Determination

To determine the existing hardware architecture that correlated with the PDRD requirements, a PDRD review was conducted, which resulted in development of the aforementioned specification trees. These trees represent a simplified model of the existing hardware for each of the four major infrastructure systems. This model was verified in two ways:

1. A PDRD cross-reference table was prepared that lists all of the system functions specified in the PDRD and relates these to the specification tree block diagrams; and
2. A system drawing reference table was compiled that lists the major drawings associated with the existing equipment (architecture).

2.4.2 Compliance with Requirements and/or Constraints

The requirements compliance analysis was conducted on several levels. A functions assessment table was prepared that contains a summary of the methods of analysis; and provides a brief findings statement associated with each major SSC. Within this effort, there were three major methods of analysis:

1. Engineering Analysis;
2. Inspection Activities; and
3. Testing Activities.

Additional information on the functions assessment table is provided in Section 3.4 of this report.

The Engineering Analysis involved review of the Engineering Design Media, plus assessment of actual physical plant conditions to determine if the system was correctly designed to meet PDRD requirements. Additional supporting documentation was referenced if it had a bearing on the determination. Further details of the Engineering Analysis are provided in Section 3.1 of this report.

2.4.3 System Performance

In some instances the Engineering Analysis and other supporting documentation included a narrative indicating system performance capability or limitations. Estimates of system life expectancy were included either in this narrative or in the activities provided in the following subsections.

2.4.3.1 Inspection Activities. Inspection activities (using the CAS process) were conducted by qualified inspectors on selected equipment. Individual equipment items were examined (when accessible), with consideration of As Low As Reasonably Achievable (ALARA) guidance. Redundant equipment (i.e., electrical terminal boxes) was sampled as it became accessible. Inspection tables were prepared that list the items inspected for each farm (see initial assessments).

The CAS methodology was developed by DOE to provide a standardized process for inspections and reviews. This method was used to guide the inspection of most of the selected equipment. Since 1993, the CAS process has been used to identify and document deficient conditions relative to DOE-owned assets. The CAS provides a formal, structured, and standardized methodology for condition inspections. It is based on a set (12 volumes) of inspection methods and deficiency standards. These include and incorporate consensus industry codes and standards, as applicable. This process has been automated and developed into the Condition Assessment Information System (CAIS). It provides a state-of-the-art tool for conducting and documenting the inspections. The standardized system output for the facility inspections was incorporated into the data.

Documentation of the inspections also includes a summary narrative that identifies key problem areas for each Tank Farm (included in the initial assessments). A description of the CAS data tables is provided in Section 3.7 of this report.

2.4.3.2 Field Assessment Questionnaire Table. These tables were prepared to support the inspection and to address specific areas of concern. The tables were used to conduct surveys of Maintenance and Operations staff concerning the performance and maintainability of specific types of hardware. A description of these tables is provided in Section 3.6 of this report.

2.4.3.3 Special Testing Activities. These activities were conducted to augment the CAS inspections and engineering analyses. This testing was guided by qualified engineering representatives, and documents were generated that reported the results.

The Hardware Assessment resulted in the development of eight technical volumes that contain the accumulated information from the inspections, tests, and reviews.

2.5 SCOPING/VALIDATION ASSESSMENT

The initial assessments team, with input from operations and others, evaluated the most effective way to address deficiencies as part of the Project W-314 scope. A screening (risk) assessment was performed on the deficiencies, using the Capital Asset Management Process (CAMP) matrix (WHC 1995g). The screening assessment was conducted to determine the impact the deficiencies may have on safety, environmental, and mission requirements. The matrix provides a substantiated and defensible means to rank all the deficiencies, and to account for significant opportunities to enhance business and mission capabilities. This information can be used to optimize efficiency by supporting a prioritized work list of work. High priority work could be scheduled first and low priority work may be deemed unnecessary in the wake of budgetary concerns. Risk-based scoping of projects is not accomplished by this document.

The sorting, validating and prioritizing process is depicted in Figure 2-2. Key elements of this process are described in the following sections.

2.5.1 Engineering Approach

The assessments team reviewed the output of the hardware assessment to determine the ability of the equipment to support operations, and to determine the most effective method to implement any upgrades/repairs identified. The team used this process along with a risk assessment to evaluate needs based upon benefit/risk, funding, and compliance with safety, and environmental requirements.

2.5.2 Prioritization of Candidate Items

All items were sorted to determine if upgrades were required, or for "as-is" acceptance. Information sheets were compiled for each identified item within each discipline (i.e., HVAC, electrical, instrumentation, piping). The supporting review process involved research and consultation with Tank Farm Operations and specific cognizant engineers. The screening assessment was conducted using the CAMP process. This process allowed the assessment team to sort all identified items into a prioritized list.

The criteria used for the prioritization process included considerations such as safety and near-term cost savings.

2.5.3 Priority List/Matrix

The prioritized candidates list was routed for Projects internal review by project managers as a recommendation, and for acceptance or revision/modification. Team members were available to explain details as requested. The prioritized list indicated how (or if) activities were to be executed.

Certain activities will be included within the Project W-314 scope by the USSR. Other activities will be conducted as short-term or near-term, capital-funded or expense-funded activities, and will be eliminated from the scope of the Project W-314 by the USSR. Other activities will not be conducted. In some cases, it was identified that no action would be required to meet the 30-year mission objectives. If there were doubts as to the category in which an activity belonged, the activity will be retained within the Project W-314 scope by the USSR.

2.5.4 Definition of Required Work

A scope/cost/duration definition effort was initiated on the prioritized items (i.e., near-term actions descope for the Project W-314). This definition represented a brief effort to produce an engineering study or sketches of the required work, with sufficient detail to formulate a good cost estimate and schedule.

Figure 2-2.Process for the Sorting, Validating, and Prioritizing Project W-314 Activities.

3.0 ANALYSIS OF THE FACILITY ASSESSMENTS

After inspection, review, and assessment completion, the USSR will use the information to formulate the basis for the Project W-314 scope.

The initial assessments contain useful supportive information and will be compiled and released as formal documents to supplement this FASR. The tables, narratives and data sheets were developed from the information gathered in the initial assessments to capture the evaluation results.

Initial assessment volumes contain information that addresses the four technical inspection areas (e.g., electrical, instrumentation and controls, piping, and ventilation). Tables and narrative sections were prepared for each volume, and for each of the categories within each volume.

The first four tables/narratives were available for each system and each area of inspection; the remaining tables were included in specific initial assessment reports, as applicable, or as information was available.

This compiled information was arranged into sections of the initial assessment reports; the following sections provide summaries of these tables and narratives.

3.1 ENGINEERING ANALYSIS

This section contains an Engineering Analysis of the assessed systems and is keyed to the Architectural Tree identification numbers. It is based on regulatory compliance issues, known maintenance problems and operational deficiencies, and a review of the Engineering Drawings. It takes its lead from other supporting documents that 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. Emergent or late identified problems/deficiencies will be incorporated into the detailed assessments and/or the USSR as appropriate.

3.2 SYSTEM ARCHITECTURE TREE BLOCK DIAGRAM

The System Architecture Tree Block Diagrams are a hierarchical-structured model of the assessed SSC. Each block depicts a system or subsystem level or a final end-item. The block diagram organization is derived from the existing engineering media (e.g., Safety Analysis Reports, drawings, safety equipment lists, etc). The structure level was determined based on providing adequate guidance to the field inspection activity. Each block is keyed to a Tank Farm or major facility, and has a unique alphanumeric reference identifier, which is a breakdown of the prior (higher) level. All assessment data are keyed to these identifiers in the architectural tree block diagrams.

3.3 PRELIMINARY DESIGN REQUIREMENTS DOCUMENT CROSS-REFERENCE TABLE

The PDRD cross-reference table contains references to all identified sections in the PDRD that apply to the assessed hardware systems. It is "keyed" to the PDRD functions, via the PDRD legal numbering system. This table helps to establish whether hardware exists to provide a related PDRD function. It also helps to ensure that all pertinent items in the PDRD are

addressed. A comments column provides brief descriptions of exceptions or unique attributes (if required or applicable).

3.4 FUNCTIONS ASSESSMENT TABLE

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

3.5 SYSTEM DRAWING REFERENCES TABLE

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

3.6 FIELD ASSESSMENT QUESTIONNAIRE AND FINDINGS

These tables provide a list of questions that elicited additional information beyond that typically obtained during the CAS. The tables are derived from the "Requirements Assessment Table." Findings consisted of inspection observations and/or the results of conversations with Maintenance and Operations staff. The source and credentials of these statements (derived by interview) were entered, along with the findings, into the column "FINDINGS/COMMENTS." In some instances, summary narrative was included as supplied by the CAS Inspectors.

3.7 CONDITION ASSESSMENT SURVEY NARRATIVES AND DETAILS

This section contains the CAS survey system data 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 were provided to summarize the assessed equipment condition.

This section also contains photographs that are representative of deficiencies found in the Tank Farms. The photographs are keyed to the Architectural Tree (System) Block-Diagram Identifier, and identified by the Plant Labeling System.

3.8 SPECIAL TESTING

This section contains specifications for special SSC testing, conducted during the evaluation, and provides the corresponding results. It references appropriate supporting document(s), if applicable.

4.0 SUMMARY AND CONCLUSIONS

The FASR, including all reviews, inspections, reports, logs, and information compiled during the supporting assessments, resulted in the information necessary to support development of the Project W-314 Upgrades Scope Summary Report. The results of this effort are addressed in the following sections.

4.1 SUMMARY OF THE FACILITY ASSESSMENT SUMMARY REPORT EFFORT

The FASR task involved the use of both historical and real-time evaluations to determine the SSC status and conditions that had previously been considered within the Project W-314 scope. At this stage of project development, information was gathered that would allow development of the upgrades project scope.

The source documentation for the FASR provided documented material to assess the existing facility condition, and to determine the requirements for upgrades. The initial scope specified in the subsequent USSR will address these requirements.

4.2 CONCLUSIONS

The FASR efforts resulted in the following observations, findings, and conclusions:

1. The Initial Assessments identified most of the facility deficiencies that will define the Project W-314 scope in the USSR; and
2. The Initial Assessments define the scope of a Detailed Assessment, as described in the SE-SOW. The Detailed Assessments will include efforts to complete information missing or not available during the Initial Assessments, and to provide studies or evaluations necessary to validate the scope identified in the USSR.
3. Changing requirements, identification of future needs, and emergent deficiencies may result in impacts to the initial scoping and prioritization for Project W-314.

5.0 REFERENCES

- DOE-RL, 1992, *Tank Waste Remediation System Functions and Requirements Document*, DOE/RL-92-60, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
- WHC, 1993, *Project W-314 Mission Analysis Report*, WHC-SD-W314-MAR-001, Rev 0, Westinghouse Hanford Company, Richland, Washington.
- WHC, 1994a, *Instrumentation and Controls Systems Engineering Study for Project W-314*, WHC-SD-W314A-ES-001, Westinghouse Hanford Company, Richland, Washington.
- WHC, 1994b, *Tank Farm Electrical Upgrades Engineering Study*, WHC-SD-W314D-ES-001, Westinghouse Hanford Company, Richland, Washington.
- WHC, 1994c, *Transfer System Upgrades Engineering Study*, WHC-SD-W314C-ES-001, Westinghouse Hanford Company, Richland, Washington.
- WHC, 1994d, *Double-Shell Tank Ventilation Systems Upgrade Engineering Study*, WHC-SD-W314B-ES-001, Westinghouse Hanford Company, Richland, Washington.
- WHC, 1995a, *Systems Engineering Statement of Work, Approach Review for Project W-314, Tank Farm Restoration and Safe Operations*, WHC-SD-W314-SOW-003, Rev 0, Westinghouse Hanford Company, Richland, Washington.
- WHC, 1995b, *Preliminary Design Requirements Document*, WHC-SD-W314-DRD-001, Working Draft, Westinghouse Hanford Company, Richland, Washington.
- WHC, 1995c, *Project W-314 Double-Shell Tank and Double-Container Receiver Tank Instrumentation and Control Systems, Initial Assessment*, WHC-SD-W314-ES-018, Westinghouse Hanford Company, Richland, Washington.
- WHC, 1995d, *Double-Shell Tank and Double-Container Receiver Tank Rank Farm Electrical Distribution Systems Initial Assessment*, WHC-SD-W314-ES-020, Westinghouse Hanford Company, Richland, Washington.
- WHC, 1995e, *Project W-314 Double-Shell Tank and Double-Container Receiver Tank Initial Assessment Report for Mechanical Systems Upgrade*, WHC-SD-W314-ES-021, Westinghouse Hanford Company, Richland, Washington.
- WHC, 1995f, *Project W-314 Double-Shell Tank and Double-Container Receiver Tank Initial Assessment Report, HVAC Systems*, WHC-SD-W314-ES-022, Westinghouse Hanford Company, Richland, Washington.
- WHC, 1996, *Project W-314 Upgrades Scope Summary Report*, WHC-SD-W314-RPT-003, Rev 0, Westinghouse Hanford Company, Richland, Washington.

DISTRIBUTION SHEET

To DISTRIBUTION	From TRANSITION PROJECTS INTEGRATION PROGRAM	Page 1 of 1 Date 4/25/96
Project Title/Work Order "Facility Assessment Summary Report for Tank Farm Restoration and Safe Operations, Project W-314", WHC-SD-W314-ES-023, Rev. 0		EDT No. 614282 ECN No. N/A

Name	MSIN	Text With All Attach	Text Only	Attach./Appendix Only	EDT/ECN Only
D. Alison	R1-51				x
K. A. Boes	R3-25	x (3 copies)			
H. M. Chafin	R3-25	x			
R. A. Dodd	S5-07	x			
J. D. Galbraith	H5-49	x			
J. E. Geary	S5-07	x			
R. L. Golberg	R3-25				x
J. L. Homan	H5-09				x
J. A. Hubbard	R2-88				x
S. E. Hulsey	R3-08				x
R. W. Jacobson	R1-09	x (3 copies)			
J. R. Kelly	B4-49				x
R. J. Kidder	A2-25				x
J. T. Koberg	G3-12	x			
J. R. Kriskovich	S2-24				x
R. W. Mattichak	R3-25				x
D. L. McGrew	R3-25	x (2 copies)			
J. E. Navarro	S7-54	x			
G. M. Ramin	S7-54	x			
D. P. Reber	T4-07	x			
R. W. Reed	S5-07	x			
M. D. Rickenbach	G3-12	x			
S. H. Rifaey	S1-57				x
W. E. Ross	S5-07	x			
M. J. Royack	S7-54				x
W. W. Rutherford	R3-25	x			
C. C. Scaief	S2-01				x
F. O. Strankman	R2-50				x
J. E. Truax	R2-50				x
K. R. Welsch	H6-26	x			
K. A. White	S5-13				x
J. H. Wicks	R2-50				x
S. U. Zaman	R3-08				x
Project Files	R1-29	x			