**ENGINEERING TASK PLAN FOR
TANKS 241-AN-103, 104, 105
COLOR VIDEO CAMERA SYSTEMS**

Impact level SQ

Ed Kohlman
October 1994

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**ENGINEERING TASK PLAN FOR
TANKS 241-AN-103, 104, 105 COLOR VIDEO CAMERA SYSTEMS**

1.0 INTRODUCTION

This Engineering Task Plan (ETP) describes the design, fabrication, assembly, and installation of the video camera systems into the vapor space within tanks 241-AN-103, 104, and 105 (AN-103, AN-104, and AN-105). The one camera remotely operated color video systems will be used to observe and record the activities within the vapor space. Activities may include but are not limited to core sampling, auger activities, crust layer examination, monitoring of equipment installation/removal, and any other activities.

2.0 SCOPE

2.1 Objective

The objective of this task is to provide a single camera system in each of the tanks for the Flammable Gas Tank Safety Program. The camera systems will provide observation, video recording, and monitoring of the activities that occur in the vapor space of tanks AN-103, AN-104, and AN-105.

2.2 Deliverables

A remotely operable camera system which is qualified for use in an atmosphere containing combustible hydrogen will be provided to Tank Farms Operations. The deliverables consist of the following.

- 2.2.1 Project supporting documentation including an ETP, procurement specifications, drawings, test plan, safety assessment, structural analysis, plant forces work review, As Low As Reasonably Achievable Management Work Sheet, dose rate calculations, and unreviewed safety question (USQ) screening (where required).
- 2.2.2 Hardware to support the camera system installation in each of the tanks. A multi-port flange assembly with a 50.8 cm (20") port, one for each of the camera installations.
- 2.2.3 New nitrogen bottle (or compressed dry air) supply system and new purge panels, similar in design to the 241-AW-101 system.
- 2.2.4 Zoom video camera, a remotely controlled pan and tilt unit, video recorder, monitor, video printer, camera control equipment, and all controls necessary to operate the system. Also to be included is a local control console with video jacks for auxiliary monitors.
- 2.2.5 Electrical lighting fixtures which conform to the National Electrical Code (NEC) Article 501 for use in a Class I, Division 1, Group B atmosphere and are listed Underwriters

Laboratory (UL) 1572, UL 844, and suitable for use in wet locations.

- 2.2.6 Installation work plan and operating and maintenance procedures as required.
- 2.2.7 Racks will be furnished to house remote monitoring, remote control, and video recording equipment in the local instrument building.

3.0 DESCRIPTION

3.1 Physical Description

These single camera, remotely operated systems include all components required to observe and record activities within the vapor space of tanks AN-103, AN-104, and AN-105.

The camera systems will consist of one radiation resistant camera assembly. The camera system will be mounted to a pan and tilt unit (modified to a roll system), capable of a pan of greater than 350° (360° field of view) and tilt of 120° minimum. The systems will also provide their own Class I, Division 1, Group B atmosphere lighting and will be deployed through a 50.8 cm (20") riser in the 106.7 cm (42") multi-flange assembly for each tank.

3.2 Procurement

All material procurement will be identified and accomplished in accordance with WHC-CM-2-1, Procurement Manual and Procedures. Lighting fixtures will include documentation which confirms compliance to the requirements stated in Section 2.2.5. Emergency procurements will be used only if time constraints on the item will exceed scheduled commitments.

3.3 Fabrication

Ancillary camera system components required for this installation will be designed and fabricated by Westinghouse Hanford Company (WHC) engineers and craftsmen. The equipment associated with this task may be developed in accordance with WHC-CM-6-1, Standard Engineering Practices, EP-2.4, "Development Control." See Section 8.0 for detailed information on requirements.

3.4 Testing

Testing of the video system will include a complete functional test of the camera system, pan and tilt unit, lighting, and purge system prior to and just after installation in the tank. Testing will be accomplished in accordance with an Impact Level SQ approved test procedure. Radiation durability of the system shall be supported by customer use documentation and will be provided by the camera system vendor.

3.5 Special Reviews

Special reviews required include a review by Materials and Process Engineering for material compatibility, review of the system design for purging to qualify it for use, review by Instrumentation Systems Engineering for risk of spark generation from electrical components, review by Safety Analysis, and a final Operational Readiness Review (Type 6 per WHC-CM-1-5, Standard Operating Practices, Section 1.2) prior to installation and operation of the system. A design review of the camera system may be performed prior to camera fabrication. In addition, a USQ determination will be performed on any documentation that will affect installation into the tank farm, in accordance with WHC-CM-1-3, Management Requirements and Procedures, MRP 5.12.

3.6 Installation

Installation will be completed by appropriate Operations personnel with technical support from Surveillance Systems Engineering (SSE) personnel. Installation will not commence until all installation work package documentation is approved in accordance with WHC-CM-8-8, Job Control System.

3.7 Maintenance/Operation

Operation and maintenance of the system will be performed through approved Tank Farm preventive maintenance and operation/maintenance documents.

3.8 Metric Units

All drawings, documents, and procedures will utilize metric units in their development. Soft conversions from English units to metric units (also known as SI units) shall be implemented on this program. For example, pipes, tubing, fittings, plate sizes, wiring, panels, etc., will be true English dimensioned components, but will be called out with its equivalent metric dimension. English unit callouts, in parentheses, will only follow those SI units which are at critical locations, interfaces with English components, or where confusion may occur with them. Bills of material will utilize both units.

Mechanical and digital pressure gauges as well as flow measuring and sensing devices will have combination measurement units called out, with the primary numbers in SI units. The pressure units will be in centimeters of water (inches of water) and/or kilopascals (psi) as required. The flow measuring devices will read in liters per minute (cfm) or similar units.

4.0 SYSTEM FUNCTIONAL PERFORMANCE DESCRIPTION

4.1 Camera Systems

- 4.1.1 The camera systems will consist of a vendor procured color zoom lensed camera and shielded housing, mast assembly, shield plug/purge manifold, and lighting system. The camera shall be designed to fit in a 50.8 cm (20") pipe riser and be mounted to the multi-flange assembly designed for this project. The multi-flange riser

shall consist of a 50.8 cm (20"), 30.5 cm (12"), and two 20.3 cm (8") 150# class flanges on standard weight pipe risers, or of a similar configuration. The primary purpose of this camera is to monitor core sampling and auger activities within the tank. The camera shall provide full tank monitoring through the use of pan and tilt and zoom capabilities. The cameras will be installed in the following 106.7 cm (42") risers in the AN tanks.

Tank	Riser
AN-103	5B
AN-104	5B
AN-105	5B

See Figures 1 and 2 for riser locations and cable/purge line routing

- 4.1.2 The visual components shall be contained in a shielded nitrogen (or compressed dry air) purged housing to withstand the radiation field anticipated for this tank. The camera assembly shall have a two-year minimum useful life expectancy. The pan and tilt (if not hydraulically operated) assembly will also be purged with the gas supply. The camera assemblies shall be designed for a radiation field of 200 R/hr, hard gamma with an average expected energy level of 0.667 MeV (Cs 132).
- 4.1.3 Purge supply lines shall be fabricated of stainless steel tubing and fittings, with the exception of the flexible lines to the camera housing and pan/tilt unit. The purge system for the new camera assembly shall include a nitrogen bottle supply system (or compressed dry air) located in the AN Tank Farm and will include a purge panel based on the design of the existing 241-AW-101 camera system. The compressed gas will purge all electrical components not listed for a Class I, Division 1, Group B hazardous location. Purging will be in accordance with the National Fire Protection Association (NFPA) Article 496.
- 4.1.4 The pan actuator shall have a full turning range of appx. 350° (360° field of view), and the tilt actuator (or roll mechanism) shall have a range of 120° minimum (- 90° from horizontal, + 30° minimum from horizontal) for full coverage of the tank interior. Flexible hoses will dictate flexibility of the tilt system. The pan/tilt unit shall be designed for and rated leak tight at a system pressure of 38 cm (15") water column or less.
- 4.1.5 A control system for the pan and tilt shall be provided. The controller and monitoring systems shall be located in an existing instrumentation building located near the AN Tank Farm. A local control console with video jacks for local monitor(s) at the riser shall also be provided.

Figure 1

Figure 2

- 4.1.6 The upper mast plate will manifold all electrical and compressed gas purge lines.
- 4.1.7 The zoom camera shall have roughly a 4:1 zoom capability (22:90 mm lens) for tank component viewing. The camera shall be capable of across-the-tank viewing 18.3 m (60') minimum, with adequate support lighting in all camera viewing situations.
- 4.1.8 Lighting fixtures shall be listed UL 1572, UL 844 for use in Class I, Division 1, Group B atmospheres. Lights shall also be suitable for use in wet locations.
- 4.1.9 All materials used in the camera design which are located in the vapor space shall be compatible with the radiological and chemical constituents. Testing shall be performed on all components that are not generally used in this environment to ensure design adequacy.

4.2 Design Verification

Verification of the design of the video systems will be documented accordingly per WHC-CM-6-1, Section 4.1. Verification approval will be for Impact Level SQ documentation. Reviews will take place in parallel with the fabrication and assembly. Installation and use of the system will not be allowed until final design verification has been completed and all required approvals have been obtained.

All electrical components located within the vapor space of the tank shall conform to the NEC Article 501 for use in a Class I, Division 1, Group B atmosphere.

Components not identified for use in combustible atmospheres, as purchased, will be qualified by purging as described in the NFPA Article 496. Approval for installation and operation in the vapor space will be upon design verification in accordance with WHC-CM-6-1, Section 4.1.

5.0 ORGANIZATIONAL RESPONSIBILITIES

Following are tasks assigned to each organization involved in the project. The items listed are the major activities for each group and may not include all areas of responsibilities that may be implied by the specific task. All appropriate training by engineering staff shall be obtained and/or maintained to satisfactorily perform onsite tasks in the tank farm.

5.1 Customer

Customer: GD Johnson (Flammable Gas Tank Safety Program)

The Customer for this project is Jerry Johnson in the Flammable Gas Tank Safety Program. The Customer will have overall input on the requirements and direction for the camera system. The Customer will provide funding and scheduling requirements for the activities.

5.2 Responsible Manager and Engineer

Responsible Manager: TL Moore (Mechanical Equipment)
Responsible Engineer: EH Kohlman (Mechanical Equipment)

The Responsible Manager has overall responsibility in implementing the design and installation of the camera systems. All other organizations will be responsible to the Responsible Manager and Engineer. The following are the major tasks of the Responsible Manager and Engineer.

- 5.2.1 Provide project management, coordination, and direction on the camera systems and related components.
- 5.2.2 Overall project scheduling and budget development.
- 5.2.3 Overall design review of the camera systems, nitrogen purge systems, and site work.
- 5.2.4 Prepare ETP.
- 5.2.5 Support and provide input to the environmental and safety assessment individuals with their tasks.
- 5.2.6 Provide lead on formal design review of camera system, if required.
- 5.2.7 Assist in system acceptance test plans (ATPs), operational test plans (OTPs), and system turnover acceptance for beneficial use (ABU).
- 5.2.8 Provide input on site work design, as required.
- 5.2.9 Provide coordination with other tank activities tied to the camera system tasks.
- 5.2.10 Provide mechanical support on the program.

5.3 Camera System Design Manager and Engineer

Camera System Design Manager: DB Smet (Surveillance Systems Engineering) AN-103, 104, 105 Camera Engineers: LT Pedersen, JL Castleberry, RA Harding (Surveillance Systems Engineering)
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The Camera System Manager and Engineer will be accountable to the Responsible Manager and Engineer and will primarily interface with the Responsible Engineer. As the title implies, the Camera System Design Manager and Engineer will be responsible for all activities associated with the camera system. Interfacing with related systems is also the responsibility of this organization. The following are the major responsibilities of this task group and may not be all inclusive.

- 5.3.1 Design of the camera system, fabrication support of the multi-flange riser assembly, design and development of the camera stand, and locating/coordinating with the instrument facility to house the camera control systems in component racks.
- 5.3.2 Provide input and interface with related systems or activities such as nitrogen purge system, electrical, environmental/safety assessments, structural/seismic analysis, etc.
- 5.3.3 Provide input to the ETP.
- 5.3.4 Provide input to environmental and safety assessment organizations, nitrogen purge activities, electrical, Quality Assurance (QA) organization, tank farm installation activities, seismic/structural reviews, and others as necessary.
- 5.3.5 Provide comment resolution, input, and support during design reviews on the camera systems.
- 5.3.6 Provide procurement documentation, including any sole source justifications required for expedited procurement. All review and comment resolutions will be performed.
- 5.3.7 Vendor interface for the camera unit. Witness functional testing at the vendor facility.
- 5.3.8 Provide guidance and direction on site work design and during camera installations. Provide work package direction and assistance as required to ensure installation success.
- 5.3.9 Provide lead coordination and direction during testing and final turnover of camera systems and ancillary equipment. Provide and lead ATP/OTP documentation.
- 5.3.10 Provide functional design criteria on the camera system to both the ETP and to the procurement specification.

- 5.3.11 Provide required documentation as identified in the ABU checklist.
- 5.3.12 Will act as the cognizant engineer, as the design authority and customer for Plant Engineering for all structures, systems, and equipment provided by this project.
- 5.3.13 Will assist in the determination what is required for "Acceptance for Beneficial Use" (ABU).
- 5.3.14 Will accept primary engineering responsibility for the camera system provided by this project after approval of ABU. Will assume ownership of the camera system.

5.4 Nitrogen Purge System Engineer

Nitrogen Purge System Engineer: R Leyva (IEMC/Refueling Mechanical Engr) - Panel Support Support Role: GL Ralston (Mechanical Equipment) - Site N2 Design
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The Nitrogen Purge System Engineers will be accountable to the Responsible Engineer for all activities and tasks performed. The following are the major responsibilities of these engineers and may not be all inclusive.

- 5.4.1 Provide complete nitrogen purge system for the camera(s). This will encompass a new purge panel for the new camera systems and nitrogen bottle facility (and/or compressed air tie-in) located at the AN Tank Farm for each of the tanks.
- 5.4.2 Responsible for interfacing with associated activities and organizations.
- 5.4.3 Provide comment resolution, input, and support during design reviews on the nitrogen system.
- 5.4.4 Provide guidance and direction on site work design and installations as required. Develop Engineering Change Notices (ECNs) as needed.
- 5.4.5 Provide support for shop testing of the purge panels with complete camera system in operation. Also provide support during testing of purge system and camera after installation.
- 5.4.6 Coordinate testing and final turnover of nitrogen system.

5.5 Electrical Support Engineer

Electrical Support Engineer: JE Dunks (Electrical Power Systems)

The Electrical Support Engineer will provide electrical support on the camera system and will be accountable to the Responsible Engineer. The Electrical Support Engineer will provide all electrical support on the task including requirements for the nitrogen purge system.

- 5.5.1 Responsible for electrical designs on the program. This includes power systems to the camera lights, pan/tilt, camera control panels, and the nitrogen purge systems.
- 5.5.2 Responsible for interfacing with associated activities and organizations.
- 5.5.3 Provide comment resolution, input, and support during design reviews on the electrical systems.
- 5.5.4 Provide guidance and direction on site work design and installations as required. Develop ECNs as needed.
- 5.5.5 Coordinate testing and final turnover of electrical systems.

5.6 Multiport Flanged Riser Support Engineer

**Multiport Flanged Riser Support Engineer: BK Schroeder
(Spent Fuel Engineering Support)**

The Multiport Flanged Riser Support Engineer will provide mechanical support on the multiport flanged risers for the tanks and will be accountable to the Responsible Engineer. The engineer will provide all required support on the task.

- 5.6.1 Provide mechanical design and fabrication support on the multiport units. This includes the multiport design, modifications, and system interfacing as required. The design will utilize, to the extent possible, the existing design of the multiport flanged riser unit.
- 5.6.2 Responsible for interfacing with associated activities and organizations.
- 5.6.3 Provide comment resolution, input, and support during design reviews on the multiport units, if required.
- 5.6.4 Provide guidance and direction on fabrication work and installations as required. Develop ECNs as needed.
- 5.6.5 Coordinate testing and final turnover of multiport units.

5.7 Camera System and Ancillary Equipment Installation Engineer

**Camera System and Ancillary Equipment Installation Engineer:
DW Strasser (Installation and Acceptance Engineering)**

The Camera System and Ancillary Equipment Installation Engineer will be responsible for the field work plans for installation of the camera system and ancillary equipment in the tank farm. The following are the major responsibilities of this engineer and may not be all inclusive.

- 5.7.1 Assist with procedures for maintenance, craft personnel, and operators for the installation of the camera and ancillary equipment in the tank farm.
- 5.7.2 Support the preparation, planning, scheduling, and performance of the Job Control System work packages in the tank farms.
- 5.7.3 Review and approve testing procedures per Conduct of Testing.

5.8 Assessments

**Environmental Documentation Review: WR Brown (Regulatory Support)
Environmental Assessment: SR Tifft (NEPA Documentation Organization)
Safety Assessment: RJ Van Vleet (Double-Shell Tank Safety Assessment)**

The support organizations will provide assessments, environmental and safety, on this program. The assessments may be part of the ongoing overall assessments or be individual assessments covering these specific areas.

- 5.8.1 Provide appropriate environmental documentation. This includes preparing a documented plan and conducting an independent assessment of operational readiness, with respect to environmental protection, and verifying that all required environmental documentation is in place relative to this task in accordance with WHC-CM-1-5, Section 1.2, "Operational Readiness Reviews." Currently this task is covered under an ongoing generic environmental assessment for these double-shell tanks.
- 5.8.2 Ensure appropriate National Environmental Protection Act (NEPA) reviews and documentation are prepared as required.
- 5.8.3 Provide safety assessment documentation. This includes preparing a documented plan and providing input for a safety review (USQ screening) on operational readiness in accordance with WHC-CM-1-5, Section 1.2, "Operational Readiness Reviews."

5.9 Structural/Seismic Support Engineer

Structural/Seismic Support Engineer: JP Strehlow (TWRS Engineering Support)

The Structural/Seismic Support Engineer will provide analysis support on the camera system and will be accountable to the Responsible Engineer. The Structural/Seismic Support Engineer will provide all analysis support on the task including interfacing with offsite analysis contractors.

- 5.9.1 Provide structural and seismic analysis support on the program. This includes analysis of the camera assembly, multiport units, camera stand, and other requested analysis needs.
- 5.9.2 Responsible for interfacing with associated activities and organizations.
- 5.9.3 Provide comment resolution, input, and support during design reviews on structures.
- 5.9.4 Provide complete analysis reports and preliminary reports to engineering when required.

5.10 TWRS Operations Support

TWRS Operations Support: MD Harding/JJ Badden (TWRS Operations)

TWRS Operations will provide Operations support on the camera system during installation and will be the end user of the system.

- 5.10.1 Provide input and reviews on the camera system designs to determine site adequacy and interface problems in the tank farms.
- 5.10.2 Responsible for installation of the camera systems into the designated tanks. This may include installation of all ancillary components as well as wiring and piping needs.
- 5.10.3 Provide resources to complete the work packages and field installations, as required. Operations will also develop and obtain approval on the readiness review.

5.11 Cognizant Engineer

Cognizant Engineer: KA White (East Tank Farms Plant Engineering)

The Cognizant Engineer will verify the planned activities and equipment to meet all associated Operational Safety Requirements, Operating Specification Document, Interim Safety Basis, and other miscellaneous requirements. The Cognizant Engineer will also provide review and approval

for activities. Specific technical information is to be obtained from the Camera System and Ancillary Equipment Installation Engineer.

5.12 ABU Requirements

This section will describe the turnover requirements on this program prior to final acceptance of the camera system. The following table "Documents Required for Acceptance for Beneficial Use" (from the ABU document) is included to identify tasks to be completed and the responsible individuals for these tasks.

6.0 SCHEDULE

All hardware for AN-104 will be ready for installation by May 10, 1995; AN-105 by July 7, 1995; and AN-103 by September 1, 1995. The ATP/OTP will be completed after installation dates for system turnover. See separate schedule for details.

7.0 COST ESTIMATE

Task	Responsible Organization	Funding Req'mts (K)
1. Materials	Camera System Design Organization	\$708.6
2. Project Lead	Responsible Manager and Engineer	\$161.1
3. Camera System Design	Camera System Design Organization	\$184.7
4. Design/Drafting	Design Services	\$76.6
5. Nitrogen Purge System	Nitrogen Purge System Engineer	\$50.9
6. Electrical Design Support	Electrical Support Engineer	\$40.6
7. Safety/Environmental Assessments	Safety and Environmental Organizations	\$52.5
8. Industrial Safety Support	Industrial Safety	\$4.4
9. Quality Assurance	Quality Assurance	\$8.8
10. OPS, HPT, Maintenance, Crane and Rigging Support	OPS, HPT, Maintenance, Crane and Rigging Organizations	\$190.0
11. Analysis	Structural and Materials Organizations	\$133.9
12. Stand/Multiports/Purge Panels Fabrication	Fabrication Shops	\$209.4
13. Site Support	ICF KH Shops/Crafts	\$74.3
TOTAL		\$1,895.8

ICF KH = ICF Kaiser Hanford Company
HPT = Health Physics Technician
OPS = Operations

DOCUMENTATION REQUIRED for ACCEPTANCE FOR BENEFICIAL USE			
DESCRIPTION	RESPONSIBILITY	DESCRIPTION	RESPONSIBILITY
<u>ENGINEERING</u>	INDIVIDUAL	<u>ENGINEERING cont'd</u>	INDIVIDUAL
• Engineering Task Plan (ETP) [X]	Kohlman	• Incorporate outstanding project generated ECNs []	
• Activity Schedule []		• Software Configuration Management Plan []	
• Final Safety Analysis Report (FSAR) []		• System Requirements Specs. []	
• Interim Safety Basis - update []		• Software Design Description []	
• Safety Assessment (SA) [X]	Van Vleet	• Validation & Verification Records []	
• Safety Equipment List (SEL) [X]	Fein		
• Operational Safety Requirements (OSR) - or update existing []		• System Qualification Plan [X]	Smet
• Operational Safety Document(s) (OSD) - or update existing []		• Personnel Qualification Record [X]	Smet
• Functional Design Criteria (FDC) [X]	Kohlman		
• Conceptual Design Report (CDR) []		<u>TRAINING</u>	
• Supplemental Design Requirements Document (SDRD) []		• Training Plan []	
• System Design Description (SDD) [X]	Smet/Kohlman	• Training Manuals []	
• Test Plan/Specifications []		• Training to Operating Crews []	
• Acceptance Test Procedures (ATPs) and Final Test Report [X]	Smet	• Training to Maintenance Crews []	
• Operational Test Procedures (OTPs) and Final Test Report [X]	Smet	• Training Mock-Up []	
• Environmental Impact Statement []		<u>OPERATIONS/ MAINTENANCE</u>	
• Environmental Report []		• Operating and Maintenance Manuals []	
• Environmental Permit []		• Operating Procedures []	
• Hazardous Waste Disposal Plan/Procedures []		• Surveillance Procedures []	
• Solid Waste Disposal Plan/Procedures []		• Calibration Procedures [X]	Smet
• Stress/Seismic Analysis [X]	Strehlow	• Preventative Maintenance Procedures [X]	Smet
• Stress/Design Report [X]	Strehlow	• Repair/Maintenance Procedures [X]	Smet
• Design Specifications/Report []		• Functional Check Procedures []	
• Equipment Specifications []		• CBRS (PM/S) Data Sheets []	
• Procurement Specifications [X]	Smet	<u>QUALITY ASSURANCE</u>	
• Construction Specifications []		• Inspection Plan []	
• Essential Material Specifications []		• QAPP []	
• Final Design Drawing(s) [X]	Smet	• QAP _J P []	
• Installation Drawing(s) []		<u>PROCUREMENT ACTIVITIES</u>	
• Installation Work Plan []		• Vendor Information Files [X]	Smet
• As-built Drawing(s) [X]	Smet	• Comprehensive Equip. List []	
• Interface Control Drawing(s) []		• Spare Parts List [X]	Smet
• IEFD Drawing(s) []		• Spare Parts in Stock []	
• Systems Drawing(s) []			
• Drawing Tree [X]	Kohlman		

8.0 QUALITY ASSURANCE

QA requirements for activities defined within the scope of work shall be in accordance with the U.S. Department of Energy, Richland Operations Office Order 5700.1A, and WHC-CM-4-2, Quality Assurance Manual. These documents establish American Society of Mechanical Engineers, Quality Assurance Program Requirements for Nuclear Facilities as the quality standard for this work. The intent is to provide assurance that the facility and equipment are adequate to meet task requirements; the prepared plans and specifications adequately state QA requirements; fabrication and construction are performed in accordance with the design; and tests confirm the adequacy of design and the quality of construction and manufactured components, where appropriate.

Acceptance testing of the camera assemblies shall be performed at the vendor's facility prior to shipment, and shall be witnessed by the camera engineer and an individual from QA. ATP/OTP testing of the camera assemblies including all purge control systems shall be performed on site after installation has been completed. Components of the purge panels shall be calibrated and tested prior to being shipped to the field.

The equipment associated with this project may be developed in accordance with WHC-CM-6-1, EP-2.4, "Development Control." The fabrication will be completed using "Development Control" design sketches followed by releasing approved as-built H-2- drawings. Changes to the "Development Control" design sketches will be controlled by either marking the changes in "red" or preparing additional sketches and identifying traceability with the affected sketch. All changes will be approved by the Responsible Engineer by signing and dating the changes. A log book should be kept to trace the drawing changes and to log the justification for each change. The drawings will also be verified through field inspection to ensure that they accurately reflect the fabricated items. The drawings will be released prior to using the equipment at the 241-AN Tank Farm. All inspection and testing requirements will be identified on the drawings and/or documentation used on this program. All inspections and tests will be documented and recorded per approved procedures.

9.0 APPROVAL DESIGNATOR

An approval designator of SQ applies to the overall work scope of the camera system installation into the AN tanks. Drawings related to the purge system and grounding requirements will be SQ. All other drawings may be Q or NA.

10.0 SAFETY CLASS

The overall safety class of this program is Safety Class 3. The following are the sub-assemblies with their respective safety classification for this task.

- 10.1 The lighting and electrical conduit and connectors which are located in the tank vapor space (tank atmosphere) will be Safety Class 3.
- 10.2 The balance of the camera, pan and tilt, support structure, and housings will be Safety Class 3.
- 10.3 Fittings, hoses, wiring, raw materials, camera stand, etc., will be Safety Class 4. Fasteners shall be Safety Class 3.
- 10.4 The control system for the purge system will be Safety Class 3.
- 10.5 Purge system components which do not control purge operation will be Safety Class 3.

Note: The purge system controls function as a passive protection system on the loss of alternating current power and loss of/or over pressurization.

DISTRIBUTION SHEET

To Distribution	From Safety Equipment Development	Page 1 of 1
Project Title/Work Order Engineering Task Plan for Tanks 241-AN-103, 104, & 105 Color Video Camera Systems		Date November 2, 1994
		EDT No. 604962
		ECN No.

Name	MSIN	Text With All Attach.	Text Only	Attach./ Appendix Only	EDT/ECN Only
JJ Badden	S5-12	1			
JL Castleberry	N1-46	1			
RA Dodd	R1-51	1			
JE Dunks	L4-90	1			
MD Harding	S5-03	1			
RA Harding	N1-46	1			
GD Johnson	S7-15	1			
EH Kohlman	H5-09	1			
LS Krogsrud	R3-08	1			
R Leyva	N2-02	1			
ML McElroy	S1-57	1			
TL Moore	H5-09	1			
LT Pedersen	N1-46	1			
GA Ralston	H5-09	1			
RW Reed	R1-51	1			
GW Rosenwald	S7-54	1			
DB Smet	N1-46	1			
DW Strasser	R1-51	1			
JP Strehlow	H5-68	1			
SR Tifft	H6-26	1			
RJ Van Vleet	H4-63	1			
KA White	R2-70	1			
Central Files (2)	L8-04	2			
TFIC	R2-95	1			
OSTI (2)	L8-07	2			

NOV 17 1994 (21)

ENGINEERING DATA TRANSMITTAL

Page 1 of 1

1. EDT 604962

2. To: (Receiving Organization) Distribution		3. From: (Originating Organization) Safety Equipment Development 7EA30 / (N2089)		4. Related EDT No.: NA							
5. Proj./Prog./Dept./Div.: 241-AN-103, 104, 105 Video Camera Systems		6. Cog. Engr.: EH Kohlman		7. Purchase Order No.: NA							
8. Originator Remarks: ETN-94-0171 The following ETP is being distributed for approval and issuance.				9. Equip./Component No.: NA							
				10. System/Bldg./Facility: 241-AN-103, 104, 105							
11. Receiver Remarks:				12. Major Assm. Dwg. No.: NA							
				13. Permit/Permit Application No.:							
				14. Required Response Date: NA							
15. DATA TRANSMITTED											
(A) Item No.	(B) Document/Drawing No.	(C) Sheet No.	(D) Rev. No.	(E) Title or Description of Data Transmitted	(F) Impact Level	(G) Reason for Trans- mittal	(H) Origina- tor Dispo- sition	(I) Receiv- er Dispo- sition			
1	WHC-SD-WM-ETP-118	A11	0	Engineering Task Plan for Tanks 241-AN-103, 104, 105 Color Video Camera Systems	SQ	1	1				
16. KEY											
Impact Level (F)		Reason for Transmittal (G)		Disposition (H) & (I)							
1, 2, 3, or 4 (see MRP 5.43)		1. Approval 2. Release 3. Information 4. Review 5. Post-Review 6. Dist. (Receipt Acknow. Required)		1. Approved 2. Approved w/comment 3. Disapproved w/comment 4. Reviewed no/comment 5. Reviewed w/comment 6. Receipt acknowledged							
(G)	(H)	17. SIGNATURE/DISTRIBUTION (See Impact Level 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. EH Kohlman	<i>E Kohlman</i>	10/24/94	H5-09	LS Krogsrud	<i>LS Krogsrud</i>	11/2/94	R3-08	1	1
1	1	Cog. Mgr. TL Moore	<i>TL Moore</i>	11/1/94	H5-09	RW Reed	<i>RW Reed</i>	11/2/94	R1-51	1	1
1	1	QA ML McElroy	<i>ML McElroy</i>	11/2/94	S1-57	JE Dunks	<i>JE Dunks</i>	11/1/94	L4-90	1	1
1	1	Safety MN Islam	<i>MN Islam</i>	11/2/94	R3-08	LT Pedersen	<i>LT Pedersen</i>		N1-46	3	
3		Env. SR Tiffet	<i>SR Tiffet</i>		H6-26	DW Strasser	<i>DW Strasser</i>	11/2/94	R1-51	1	1
1	1	DB Smet	<i>DB Smet</i>	11/8/94	N1-40	RJ Van Vleet	<i>RJ Van Vleet</i>		H4-63	3	
1	1	JJ Badden	<i>JJ Badden</i>	11-10-94	S5-12	MD Harding	<i>MD Harding</i>		S5-03	3	
1	1	KA White	<i>KA White</i>	11/4/94	R2-70	GD Johnson	<i>GD Johnson</i>	11/8/94	S7-15	1	1
1	1	R. Leyva	<i>R. Leyva</i>	11/6/94	N2-02	JP Strehlow	<i>JP Strehlow</i>		H5-68	3	
18.		19.		20.		21. DOE APPROVAL (if required) Ltr. No.					
<i>E Kohlman</i> Signature of EDT Originator		<i>E Kohlman</i> Authorized Representative for Receiving Organization		<i>TL Moore</i> Cognizant/Project Engineer's Manager		☐ Approved ☐ Approved w/comments ☐ Disapproved w/comments					

RELEASE AUTHORIZATION

Document Number: WHC-SD-WM-ETP-118, REV.0

Document Title: ENGINEERING TASK PLAN FOR TANKS 241-AN-103, 104, 105
COLOR VIDEO CAMERA SYSTEMS

Release Date: 11/17/94

**This document was reviewed following the
procedures described in WHC-CM-3-4 and is:**

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WHC Information Release Administration Specialist:

Niki L. Solis

11/17/94

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SUPPORTING DOCUMENT

1. Total Pages 20

2. Title

Engineering Task Plan for Tanks 241-AN-103, 104,
105 Color Video Camera Systems

3. Number

WHC-SD-WM-ETP-118

4. Rev No.

0

5. Key Words

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Tank Farm
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6. Author

Name: EH Kohlman

Signature

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7. Abstract

11/17/94 M. J. J. J.

This Engineering Task Plan describes the deliverables and responsibilities on the installation of color zoom camera systems into the vapor space of tanks 241-AN-103, 104, and 105. The systems will utilize all new components which include such items as the vendor furnished mast, light assembly, manifold and shield, pan & tilt unit, and camera. The nitrogen supply and purge panel will be fabricated onsite for these systems.

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9. Impact Level SQ

10. RELEASE STAMP