2. To: (Receiving Organization)  
   Distribution

3. From: (Originating Organization)  
   Surveillance Systems Integration

4. Related EDT No.:  
   617446

5. Proj./Prog./Dept./Div.:  
   241-AZ-101 Video Camera System

6. Design Authority/Design Agent/Cog. Engr.:  
   RS Robinson

7. Purchase Order No.:  
   N/A

8. Originator Remarks:  
   ETN-95-038

9. Equip./Component No.:  
   RCS-551

10. System/Bldg./Facility:  
    241-AZ-101

11. Receiver Remarks:  
   11A. Design Baseline Document?  [ ] Yes  [X] No

12. Major Assm. Dwg. No.:  
   N/A

13. Permit/Permit Application No.:  
   N/A

14. Required Response Date:

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18. Signature of EDT Date  
   Originator
   RS Robinson  8-29-96

19. Authorized Representative Date for Receiving Organization
   [Signature]

20. Design Authority/Manager Date
   [Signature]

21. DOE APPROVAL (if required)
   Ctrl. No.
   [Signature]  Signed  [Date]
   [Approved] [Approved w/comments] [Disapproved w/comments]
OPERATIONAL TEST PROCEDURE 241-AZ-101 
WASTE TANK COLOR VIDEO CAMERA SYSTEM

Abstract: The purpose of this procedure is to provide a documented 
means of verifying that all of the functional components of the 241-AZ- 
101 Waste Tank Video Camera System operate properly before and after 
installation.
OPERATIONAL TEST PROCEDURE
241-AZ-101 WASTE TANK COLOR VIDEO
CAMERA SYSTEM

Surveillance Systems Integration
# TABLE OF CONTENTS

1.0 PURPOSE ................................................................. 2

2.0 OBJECTIVE ................................................................... 2

3.0 REFERENCES .................................................................. 2

4.0 SAFETY ......................................................................... 3

5.0 RESPONSIBILITIES ........................................................ 3
5.1 SURVEILLANCE SYSTEMS INTEGRATION (SSI) ............... 3
5.2 TEST WITNESSES ........................................................... 3

6.0 DOCUMENTATION .......................................................... 3
6.1 TEST RECORDS ............................................................... 3
6.2 EXCEPTIONS ................................................................... 4
6.3 TEST EXECUTION RECORD .............................................. 4

7.0 PRE-INSTALLATION OPERATIONAL TEST STEPS ............ 4
7.1 PREREQUISITES .............................................................. 4
7.2 ELECTRICAL SHUTDOWN CONTROL PANEL (ESCP) ....... 5
7.3 RCS-551 CAMERA UNIT OPERABILITY ......................... 7
7.4 PTE-600 PAN AND TILT OPERABILITY ............................ 8
7.5 LOSS OF PURGE SHUTDOWN VERIFICATION .................... 9
7.6 FINAL ACCEPTANCE ....................................................... 9

8.0 POST-INSTALLATION OPERATIONAL TEST STEPS ........... 10

9.0 RECORDS ..................................................................... 10
9.1 DATA/VERIFICATION LIST ............................................... 10
9.2 TEST EXECUTION RECORD .............................................. 11

10.0 EXCEPTIONS ................................................................. 12

FIGURE 1. CAMERA MAST COMPONENTS ............................... 13

FIGURE 2. ELECTRICAL CONFIGURATION ............................. 14
1.0 PURPOSE

This procedure will document the satisfactory operability of the 241-AZ-101 Waste Tank Color Video Camera System. The camera assembly, including camera mast, pan-and-tilt unit, camera, and lights, will be installed in Tank 241-AZ-101 to monitor activities during the Double Shell Tank (DST) Retrieval Project. See Figure 1 for a diagram of the camera assembly.

The testing portions of this procedure are performed in two separate sections (7.0 and 8.0) identified below:

- Section 7.0 (Pre-Installation Operational Test) will be performed at the 200 East Area in the 241-AZ Tank Farm following installation of the master control station components, cables and local interface panel. The camera assembly will be lifted by a mobile crane in accordance with an approved installation procedure. This test will be performed while the camera assembly is suspended from the crane prior to installation into the designated riser.

- Section 8.0 (Post-Installation Operational Test) will be performed at the 200 East Area at the 241-AZ Tank Farm following installation of the camera assembly into the designated riser in tank 241-AZ-101.

2.0 OBJECTIVE

The objective of this procedure is to demonstrate and document the operability of the 241-AZ-101 Waste Tank Color Video Camera System. The camera focus, iris, and zoom remote controls will be functionally tested. The pan-and-tilt unit will be tested for required ranges of motion, and the camera lights will be functionally tested. The purge function of the camera will be functionally tested to verify that ten volumes of air are exchanged during purge cycle, and that pressure and flow exists during operation of the system. Automatic electrical shutdown of system upon loss of pressure will be demonstrated.

3.0 REFERENCES

- Purchase Specification WHC-S-0410, Rev 1 (P.O.# W-408171), "241-AZ-101, W151 Project, Suspended Fixture and Weld Inspection Camera System."


4.0 SAFETY

A pre-job meeting will be held prior to performing the OTP. Potential tripping hazards, lifting techniques and equipment safety issues will be addressed as part of the pre-job. Only the test Engineer, and/or approved personnel shall operate the camera system and related equipment.

5.0 RESPONSIBILITIES

5.1 SURVEILLANCE SYSTEMS INTEGRATION (SSI)

SSI will provide the Test Engineer. The Test Engineer will ensure that all necessary preparations for this OTP have been completed prior to beginning the test. The Test Engineer will organize and give final direction for the test activities. The Test Engineer may be the Cognizant Engineer, or other SSI personnel familiar with the 241-AZ-101 Waste Tank Color Video Camera System. SSI will coordinate all of the arrangements necessary to perform the OTP. An Operational Test Report (OTR) will be issued upon completion of this OTP.

5.2 TEST WITNESSES

DST Retrieval Projects, Operations and Quality Assurance will provide a representative to witness the satisfactory completion and approval of pertinent steps identified in this procedure. Witnesses are responsible for verifying that organizational requirements are met throughout the testing and documentation sequences of the procedure.

6.0 DOCUMENTATION

6.1 TEST RECORDS

6.1.1 All personnel involved in the performance of this test including SSI Test Engineer shall fill out a line in Section 9.0, RECORDS.

6.1.2 Test results shall be recorded by the SSI Test Engineer. All entries into this test procedure shall be made in black ink. The signature or initial of the person accepting the item will be entered in the blank provided to indicate compliance with the stated requirements or the successful
completion of the given test step. Errors shall be corrected by crossing out
the incorrect data with a single line and the correct response shall be
written in the direct vicinity of the original item. The person making the
correction shall initial and date the correction. Unacceptable conditions or
readings shall be resolved in accordance with Section 10.0, EXCEPTIONS.
A complete working copy of this procedure and any exception records
generated shall be maintained as a permanent record.

6.2 EXCEPTIONS

Exceptions by step number, and other notes, are to be recorded in Section 10.0.
This section must be dispositioned (including the generation of any required
ECNs) and signed off prior to final OTP acceptance. If no exceptions are
encountered, this section may be so noted and closed out with the required
signatures.

6.3 TEST EXECUTION RECORD

The final acceptance of the OTP results shall be indicated by signatures listed
under Section 9.2, TEST EXECUTION RECORD. SSI will also issue an
Operational Test Report (OTR) upon completion of this OTP.

7.0 PRE-INSTALLATION OPERATIONAL TEST STEPS

7.1 PREREQUISITES

7.1.1 The Test Engineer shall verify that all the components to the 241-AZ-101
Camera System are properly connected prior to energizing the system, (see
Figures 1 and 2).

Component Connections:

- Camera Control Unit
- Video Tape Recorder
- Color Monitor
- Electrical Shutdown Control Panel (ESCP)
- Gas Supply (Compressor or Farm Instrument Air)
- Local Interface Box
- Camera Mast Junction Box

7.1.2 Verify/Ensure that the locking collar is positioned and secured properly.

SSI Test Engineer Initial _______
7.1.3 Verify/Ensure that cables and hoses are connect to the top of the mast and have strain relief.

SSI Test Engineer Initial

7.1.4 Camera mast is to be lifted by a crane into a vertical configuration to perform operational testing.

SSI Test Engineer Initial

7.1.5 Adjust and verify that the camera is hanging in the 180 degree position (straight down) and the tilt arms are secured.

SSI Test Engineer Initial

7.1.6 Verify steps 7.1.1 through 7.1.5 are complete.

Test Engineer Date

7.2 ELECTRICAL SHUTDOWN CONTROL PANEL (ESCP) OPERABILITY

7.2.1 Verify ESCP unit, Serial Number 0004, has been attached to system.

SSI Test Engineer Initial

7.2.2 POWER display located on the front face of the ESCP illuminates when the unit ON/OFF switch is moved to the ON position and power is available inside the box. Apply power to the unit and verify that the POWER light is functional.

SSI Test Engineer Initial

7.2.3 Turn on gas supply to allow for flow and pressure through the ESCP.

SSI Test Engineer Initial

7.2.4 START/RESET display located on the front face of the ESCP operates when flow has been sensed. Press the START/RESET button and verify that the FLOW indicator illuminates.

SSI Test Engineer Initial
7.2.5 PRESSURE #1 and PRESSURE #2 displays illuminate when pressure is sensed. With the START/RESET button previously activated, verify that the PRESSURE #1 and PRESSURE #2 indicators illuminate.

SSI Test Engineer Initial

7.2.6 PURGING display illuminates when the ESCP begins the purge cycle. After pressing the START/RESET button, verify that the PURGING indicator is illuminated.

SSI Test Engineer Initial

NOTE: The total volume of the camera mast system (mast, camera housing, light housing, pan-and-tilt, and hoses) is 1.53 ft$^3$. Per NFPA 496 requirements, ten volumes of purge air or 15.3 ft$^3$, must flow through the system. The Time Delay Relay (TDR) located in the Electrical Shutdown Control Panel (ESCP) will be adjusted to a minimum of 10.2 minutes at a minimum flow rate of 1.5 cfm, (15.3 ft$^3$/1.5 cfm = 10.2 minutes) to allow for 15.3 ft$^3$ total flow.

7.2.7 Press the START/RESET switch located on the ESCP to begin purge cycle. With a stopwatch, time the duration of the purge cycle. Purge cycle will be complete when LOAD ENERGIZED indicator located on ESCP illuminates and power is provided to camera and lights. Verify purge cycle duration is 10.2 minutes or greater. (Time should be approximately 11.5 minutes)

SSI Test Engineer Initial

7.2.8 Once purge cycle has begun, place hand over pressure relief valve and verify that flow is present at pressure relief valve located at the light housing of the camera system. Test Engineer's signature below will verify flow is present.

SSI Test Engineer Initial

7.2.9 LOAD ENERGIZED display illuminates when the ESCP has enabled power output to the 241-AZ-101 Camera System. After the unit has completed its purge cycle, verify the LOAD ENERGIZED indicator is illuminated.

SSI Test Engineer Initial
7.2.10 SSI Test Engineer sign that steps 7.2.1 through 7.2.9 are complete.

Test Engineer ____________ Date ______

7.3 RCS-551 CAMERA UNIT OPERABILITY (Serial Number 632)

7.3.1 Using remote camera zoom control, manipulate the zoom control to wide angle. VERIFY the zoom moves towards wide when operated towards "wide".

SSI Test Engineer Initial ______

7.3.2 Manipulate the zoom control to telephoto. VERIFY the zoom moves towards telephoto when operated towards "telephoto".

SSI Test Engineer Initial ______

7.3.3 Manipulate the iris control to fully open. VERIFY the iris moves towards open when operated.

SSI Test Engineer Initial ______

7.3.4 Manipulate the iris control to the fully closed position. VERIFY the iris moves towards the closed position when operated.

SSI Test Engineer Initial ______

7.3.5 Using the near focus control. VERIFY that the focus adjusts to near when focused on an object that is "near".

SSI Test Engineer Initial ______

7.3.6 Using the far focus control. VERIFY that the focus adjusts to far when focused on an object that is "far".

SSI Test Engineer Initial ______

7.3.7 Turn on the system lights. Verify that light #1 and #2 are functioning.

SSI Test Engineer Initial ______

7 ETN-95-038
7.3.8 Using the light intensity control. Verify the light intensity can be adjusted up and down.

SSI Test Engineer Initial

7.3.9 Verify the video monitor and video recorder are operational.

SSI Test Engineer Initial

7.3.10 VERIFY steps 7.3.1 through 7.3.9 are complete.

Test Engineer __________________ Date __________

7.4 E'TE-600 PAN AND TILT OPERABILITY (Serial Number 629)

7.4.1 Using the remote pan control, pan in the clockwise direction until stop is reached. Verify pan encoder reads 1 degree or less.

SSI Test Engineer Initial

7.4.2 Pan in the counterclockwise direction until stop is reached. Verify pan encoder reads 358 degrees or greater.

SSI Test Engineer Initial

7.4.3 Tilt the camera to the extreme back position. verify that the camera encoder reads 270 degrees or greater and the electronic brake holds.

SSI Test Engineer Initial

7.4.4 Tilt the camera up to the extreme upward position. VERIFY that the tilt encoder reads 70 degrees or less and the electronic brake holds.

SSI Test Engineer Initial

7.4.5 Place the camera tilt in the 180 degree position for installation.

SSI Test Engineer Initial

7.4.6 VERIFY steps 7.4.1 through 7.4.5 are complete.

SSI Test Engineer __________________ Date __________
7.5 LOSS OF PURGE SHUTDOWN VERIFICATION

7.5.1 Manually disconnect the air supply to the camera at the input to the ESCP. Verify that system power down occurs immediately after gas flow is interrupted and that SYSTEM ENERGIZED and FLOW indicator lights located on the ESCP are no longer illuminated.

SSI Test Engineer Initial

7.5.2 Verify that the PRESSURE 1 and PRESSURE 2 indicator lights are no longer illuminated after all pressure has been bled out of the system.

SSI Test Engineer Initial

7.5.3 Reconnect the air supply to input of the ESCP unit.

SSI Test Engineer Initial

7.5.4 VERIFY steps 7.5.1 through 7.5.3 are complete.

SSI Test Engineer Initial Date

7.6 FINAL ACCEPTANCE

Pre-Installation testing per this procedure is completed satisfactorily and the 241-AZ-101 Video Camera System is ready for installation.

SSI Test Engineer: Date

Operations: Date

Quality Representative: Date

DST Retrieval Projects: Date
8.0 POST-INSTALLATION OPERATIONAL TEST STEPS

Repeat sections 7.2 (Step 7.2.8 shall not be performed), 7.3 and 7.4 of this procedure to ensure that the 241-AZ-101 Video Camera System is operating satisfactorily after installation of the camera assembly into the designated riser.

SSI Test Engineer: ________________________________ Date______

Operations: ________________________________ Date______

Quality Representative: ________________________________ Date______

DST Retrieval Projects: ________________________________ Date______

9.0 RECORDS

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9.2 TEST EXECUTION RECORD

Signatures below indicate concurrence with the following:

- The objectives delineated in Section 2.0 of this procedure have been achieved
- All recorded exceptions have been resolved, the resolutions approved and any necessary retesting completed
- The 241-AZ-101 Video Camera System is ready for service.

SSI Test Engineer: ____________________________ Date ____________

Operations: ____________________________ Date ____________

Quality Representative: ____________________________ Date ____________

DST Retrieval Projects: ____________________________ Date ____________
10.0 EXCEPTIONS

EXCEPTION SHEET NUMBER: _____

PROCEDURE STEP: _____

Note: Make additional copies of this page as necessary.

Description of Problem:

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

Exception Resolution:

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

SSI Test Engineer: ___________________________ Date __________

Operations: ___________________________ Date __________

Quality Representative: ___________________________ Date __________

DST Retrieval Projects: ___________________________ Date __________
FIGURE 1. CAMERA MAST COMPONENTS
241-AZ-101 CONNECTION DETAIL

Master Control Unit 241-AZ-156

Air Supply

Farm Power 117 volts AC Input

Pressure Switches

ELECTRICAL SHUTDOWN BOX

Local Junction box

59ft R4404

Local Interface Box

ETN-95 - 038

Upper Junction Box

1200ft Gas Line

PTE-600 Pan & Tilt

RCS-551 Camera

Light

CAMERA MAST

FIGURE 2. ELECTRICAL CONFIGURATION
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**Date** 8/30/96

**Project Title/Work Order**

PROJECT W-151, Operational Test Procedure WHC-SD-WM-OTP-218, Rev. 0, for the 241-AZ-101 camera system.

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**ECN No.** NA