JUN 06 1995 (58)

ENGINEERING DATA TRANSMITTAL

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3	1	Cog. Eng. SM Werry	<i>[Signature]</i>	6/6/95	N1-46
3	1	Cog. Mgr. DB Smedley	<i>[Signature]</i>	6-6-95	N1-46
3		QA ML McElroy			S7-07
3		Safety LS Krogsrud			R3-08
		Env.			
3		JD Dunks			L4-90
3		JL Castleberry			N1-46
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<i>[Signature]</i> 6/6/95		<i>[Signature]</i> 6-6-95		<i>[Signature]</i> 6-6-95	
Date		Date		Date	
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Release Date: 6/6/95

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

APPROVED FOR PUBLIC RELEASE

WHC Information Release Administration Specialist:

Kara M. Broz

June 6, 1995

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5. Key Words SY Tank Camera Purge System Color Video Imaging System Test Report	6. Author Name: SM Werry <i>SM Werry</i> Signature Organization/Charge Code 74900/N2B2H	
7. Abstract This Acceptance/Operational Test Report provides record information on satisfactory completion of WHC-SD-WM-OTP-158 "ATP/OTP 101-SY Camera Purge System and In Tank Color Camera Video Imaging System."		
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ACCEPTANCE/OPERATIONAL TEST PROCEDURE
101-SY TANK CAMERA PURGE SYSTEM AND
IN TANK COLOR CAMERA VIDEO IMAGING SYSTEM

1.0 PURPOSE

This procedure will document the satisfactory operation of the 101-SY tank Camera Purge System (CPS) and 101-SY in tank Color Camera Video Imaging System (CCVIS). Included in the CPS is the nitrogen purging system safety interlock which shuts down all the color video imaging system electronics within the 101-SY tank vapor space during loss of nitrogen purge pressure. This procedure is separated into three sections (7.1, 7.2 and 7.3) identified below:

- 1) Section 7.1 verifies that PR-1, the regulator which maintains a positive pressure within the volume (cameras and pneumatic lines), is properly set. In addition, the correct flowrate is obtained to meet the requirements of National Fire Protection Association (NFPA), Article 496, for a Class 1, Division 1, Group B atmosphere.
- 2) Section 7.2 verifies that the purge cycle functions properly, the green light (PURGE ON) comes on, and that the safety interlock operates correctly during loss of purge pressure. During the loss of purge condition the operation of the red (In-Service) light will be verified.
- 3) Section 7.3 verifies that the color cameras, lights, pan and tilt and associated controls and components operate correctly.

2.0 TEST OBJECTIVES

Demonstrate the acceptability/operation of the color camera purge control system components, nitrogen purging safety interlock system and video imaging system.

3.0 REFERENCES

Tank Farms Health and Safety Plan	WHC-CM-4-3
Engineering Task Plan	WHC-SD-WM-ETP-011
SY Farm In Tank Video Installation	H-2-822805
200 Area Tank Camera Purge Mech.	H-2-822793
101-SY Color Camera Elect.	H-2-822794
101-SY Color Camera P & I	H-2-822795
ECN - 177415	
CVI File - 22580	

4.0 RESPONSIBILITIES

4.1 SURVEILLANCE SYSTEMS ENGINEERING

A Surveillance Systems Engineering (SSE) Test Engineer shall be responsible for the coordination, scheduling, performance and documentation of the test procedure.

4.2 TEST WITNESSES

Tank Farm Operations and their Quality Assurance will provide a representative to witness the satisfactory completion and approval of pertinent steps identified in this ATP/OTP.

Witnesses are responsible for verifying that organizational requirements are met throughout the testing and documentation sequences of the procedure.

5.0 DOCUMENTATION

5.1 TEST RECORD

All personnel involved in the performance of this test including the SSE Test Engineer shall fill out a line in Section 9.0 Records.

Test results shall be documented by the SSE Test Engineer. Unless specific data is required, the initials of the person verifying acceptance will be entered in each test sheet blank to indicate compliance with the stated requirements or the successful completion of the given test step.

The SSE Test Engineer will maintain a chronological test log, documenting when various phases of the test are conducted and any pertinent information not recorded in the test procedure.

5.2 EXCEPTIONS

Exceptions by step number, and other notes are to be recorded under Section 8.0. This section must be dispositioned and signed off prior to final ATP/OTP acceptance. If no exceptions are encountered, this section may be so noted and closed out with the required signatures.

5.3 TEST EXECUTION RECORD

The final acceptance of the ATP/OTP results shall be indicated by signatures listed under Section 10.0.

NOTE: During the performance of this test, errors in text may be encountered which require correction/adjustment to complete the test. The correction is to be noted in the ATP/OTP and listed as an exception in Section 8.0.

6.0 PREREQUISITES

6.1 TEST COORDINATION

The SSE Test Engineer shall ensure:

- test witnesses receive timely notification of the test schedule.
- qualified support personnel have been scheduled.
- a test log (chronological log of events during testing) is maintained.
- tools and equipment required for testing have been staged and the following instrumentation calibrated.

Pressure Switch (H-2-822793-11)

Pressure Transmitter (H-2-822793-10)

Pressure Indicating Switch (H-2-822793-14)

Pressure Gages (H-2-822793-14,15)

Flow Meter (H-2-822793-9)

Flow Meter (H-2-822793-17)

Relief Valve (H-2-822793-18)

SSE TEST ENGINEER

10/4/94
Date

6.2 200 AREA MAINTENANCE

- 6.2.1 Verify that the nitrogen supply and return lines from the Purge Panel to the 101-SY color camera are connected per H-2-822805.

OPS J. R. Buggy 1 10/4/94
Date

7.0. ACCEPTANCE/OPERABILITY TEST

7.1 PURGE PANEL ACCEPTANCE

NOTE: Sequence of steps in section 7.1 can be altered per SSE Test Engineer discretion.

- 7.1.1 Turn on breakers #4, #5, and #7 located in Distribution Panel VDP-2 inside the 241-SY Video Shack.
- 7.1.2 Open the nitrogen supply valve and adjust PR-2 to 45 ± 5 psig.
- 7.1.3 Pressurize each leg (supply and return side) of the 101-SY Purge Panel, H-2-822793, to approximately 2.0 psig and "Snoop" each fitting and resolve any leakage by tightening the fitting. If the leakage continues then replace the fitting.
- 7.1.4 The volume of the camera housing, purge panel lines and the hoses, is approximately 2.0 ft.^3 ($1.1 + .16 + .65 \text{ ft.}^3$). Per NFPA 496 requirements, ten volumes of purge gas, 20 ft.^3 , must flow through the assembly. The purge pressure will be set by adjusting PR-1 so that a minimum of 20 ft.^3 will flow through the assembly in 10 minutes or less (2 CFM minimum). Adjust the purge pressure at PR-1 to obtain a flowrate of $2.3 +0.4/-0.0$ CFM. The purge flow rate will be read from the flowmeter, H-2-822793-9. The purge pressure will be read from pressure gages, H-2-822793-15 (supply) and H-2-822793-14 (return). Record below the final flowrate and pressures.

Flowrate: 2.3 CFM Pressure: 11 psig (SUPPLY)
Pressure: > 10 psig (RETURN)

- 7.1.5 Step 7.1 is complete.

SSE Test Engineer J. R. Buggy 1 10/4/94
Date
OPS K. W. Walling 1 10/4/94
Date
QC 1 10/4/94
Date

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7.2 PURGE CONTROL PANEL ACCEPTANCE

7.2.1 Adjust the Time Delay Relays (TDR1 and TDR2) to 10 minutes. Push the "Start" pushbutton and hold until the amber (Pressurized) light comes on indicating that pressure is satisfactory and that the purging has begun.

7.2.2 Sign off below that the amber light comes "ON".

[Signature] 1 10/4/94
SSE Test Engineer Date
[Signature] 1 10/4/94
OPS Date

7.2.3 Plug the pan and tilt and camera control unit into the safety interlock system receptacle located in Video Shack. Turn on the power switches to the pan and tilt and camera controls.

* 7.2.4 After the 10 minutes has elapsed verify that the green (Purging) light is off and that the Red (In-Service) light is "On" and that the camera lights have come "On" and that power is being provided to the pan and tilt and camera control equipment.

SEE

EXCEPTION #1

[Signature] 1 10/4/94
SSE Test Engineer Date
[Signature] 1 10/4/94
QC Date

7.2.5 Turn off valve PR-2 and allow the gas to bleed off to the set point on PS (low pressure switch) 10 ± 1 in. w.g. Verify camera lights go off and the red light (In-Service) goes off. Also verify that power is no longer being supplied to the pan and tilt and camera control equipment. QC signoff below that the lights turned off and power was no longer supplied to pan and tilt and camera control equipment at 10 ± 1 in. w.g.

[Signature] 10/4/94
SSE Test Engineer Date
[Signature] 1 10/4/94
QC Date

7.2.6 Signoff below that the red light goes out and record below the pressure where the light dropped out.

Pressure : 10.0" w.g.

[Signature] 1 10/4/94
OPS Date

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7.2.7 Open the valve on PR-2 to 45 ± 5 psig. Restart the purging process by pushing the "Start" pushbutton and hold until the amber (Pressurized) light comes on indicating that pressure is satisfactory and that the purging has begun.

7.2.8 Step 7.2 is complete *S M W* SSE Test Engineer.

7.3 COLOR CAMERA VIDEO IMAGING SYSTEM

7.3.1 Ensure the CPS is operating by visually verifying the Red (In Service) light is "ON".

Note: This video imaging system test includes two cameras. They will be referred to as cameras one and two. Camera one (1) provides pan and tilt capabilities and camera two (2) is a fixed view camera. Camera one (1) is tested in steps 7.3.1 through 7.3.13. Camera two (2) is tested in steps 7.3.14 through 7.3.16. The SSE Test Engineer will verify and initial satisfactory completion of the following steps.

7.3.2 Plug video monitor/s, video recorder and video printer into power source. Verify video monitor, video recorder, frame store integrator and video printer have power and are operational *S M W*.

7.3.3 Verify that there is a color video image being transmitted on the video camera 1 system monitor (located in the 241-SY Video Shack) *S M W*.

7.3.4 Using remote pan and tilt controls, pan in the clockwise direction. Verify that the pan electronic break holds *S M W*.

7.3.5 Pan in the opposite direction. Verify that the pan electronic break holds and that the panning operation has covered approximately 360° *S M W*.

7.3.6 Tilt the camera to the extreme down position. Verify that the camera is pointing down approximately vertically and that the electronic break holds *S M W*.

7.3.7 Tilt the camera to the extreme upward position. Verify that the camera electronic break holds *S M W*.

7.3.8 Using remote camera zoom control, manipulate the zoom control to wide angle. Verify zoom moves towards wide and when operated towards "wide" *S M W*.

7.3.9 Manipulate the zoom control to telephoto. Verify zoom moves towards telephoto when operated towards "tele" *S M W*.

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- 7.3.10 Using remote camera iris control, manipulate the iris control to open. Verify that the iris opens when operated towards "open" SMD.
- 7.3.11 Manipulate the iris control to close. Verify that the iris closes when operated towards "close" SMD.
- 7.3.12 Using remote camera focus control, manipulate the focus control to far. Verify that the focus adjusts to far when operated towards "far" SMD.
- 7.3.13 Manipulate the focus control to near. Verify that the focus adjusts to near when operated towards "near" SMD.

Camera 1 test is complete.

<u>J R Byrd</u>	<u>10/4/94</u>
OPS	Date
<u>Ken Willoughby</u>	<u>10/4/94</u>
QC	Date
<u>S M Wemy</u>	<u>10/4/94</u>
SSE Test Engineer	Date

- 7.3.14 Verify that there is a color image being transmitted on the Camera 2 system monitor and the image is in focus SMD.
- 7.3.15 Verify the frame store integrator and video recorder are operational SMD.
- 7.3.16 Verify the electronic shutter control is operational SMD.

Camera 2 test is complete.

<u>J R Byrd</u>	<u>10/4/94</u>
OPS	Date
<u>Ken Willoughby</u>	<u>10/4/94</u>
QC	Date
<u>S M Wemy</u>	<u>10/4/94</u>
SSE Test Engineer	Date

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8.0 EXCEPTIONS

ITEM	STEP	PAGE	DESCRIPTION/REASON	DISPOSITION/RESOLUTION
#1	7.2.4	6	TIME DELAY IS 18 MIN. S INSTEAD OF 10	ADEQUATE PRESSURE AND ADEQUATE ^{FLOW} ARE BEING MET AND EXCEEDED. THIS SAFETY FUNCTION IS CONSERVATIVE. THIS WAS ENGINEERED TO PROVIDE THAT MINIMUM VOLUME REQUIREMENTS ARE MET OR EXCEEDED.

TEST APPROVED WITH EXCEPTIONS

THIS EXCEPTION IS
ACCEPTABLE.

S.M. Gentry 10/4/94
SSE Test Engineer

* M. L. McElroy 10/5/94
Quality Control

J. R. Byrd 10/4/94
Tank Farm Operations

* ALL QC STEPS ACCEPTABLE EXCEPT FOR
EXCEPTION #1 QA NEEDS TO REVIEW.
KW 10/4/94

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9.0 RECORDS

DATA/VERIFICATION LIST

NAME PRINT	NAME SIGN	INITIALS	POSITION	DATE
James R. Bigger	<i>JRB</i>	<i>JB</i>	WTFO (OPS)	10/4/94
KEN WILLoughBY	<i>KW</i>	<i>KW</i>	OC	10/4/94
Jim L. CASTLEBERG	<i>JL</i>	<i>JA</i>	SSE ENG.	10/4/94
Sgt WERRY	<i>SW</i>	<i>SW</i>	SSE TEST ENG.	10/4/94

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10.0 TEST EXECUTION RECORD

REFERENCE SECTION	ACCEPT / REJECT	REMARKS
7.1 <i>Complete</i>	<i>ACCEPT</i>	
7.2 <i>Complete</i>	<i>ACCEPT</i>	<i>SEE EXCEPTION #1</i>
7.3 <i>Complete</i>	<i>ACCEPT</i>	

TEST WITNESSES:

*SEE
EXCEPTION
#1*

S. M. Wang 10/4/94
SSE Test Engineer / Date

* *K. W. Young* 10/5/94
Quality Control / Date

J. L. Bazz 10/4/94
Tank Farm Operations / Date

10.1 FINAL ACCEPTANCE

Testing per this procedure is completed satisfactorily and the 101-SY CPS and CCVIS are ready for installation and service.

J. L. Bazz 10/4/94
Tank Farm Operations / Date

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11.0 POST INSTALLATION TEST

Repeat Steps 7.1, 7.2, and 7.3 of this procedure to ensure that the 101-SY CPS and CCVIS are operating satisfactorily after installation of Camera into riser 5A of tank 101-SY. Any discrepancies found with the 101-SY CCVIS and CPS in accordance with this section of the ATP/OTP shall be noted below. Section 11.0 shall not be complete without the SSE Test Engineers signature.

[Signature] 10/7/94
SSE Test Engineer / Date

ETN-94-0028

12.0 SSE QUALIFICATION RECORD

SSE CCTV SYSTEM QUALIFICATION RECORD

Qualified SSE CCTV Operator:

J.L. Castleberry

Payroll Number:

82989

Date:

09/27/94

Complete Description of CCTV System Components:

101-SY COLOR CAMERA VIDEO IMAGING SYSTEM -

531 per Smwwey 4/6/95

RCS-541 Radiation Tolerant Gas Purged Zoom Color Camera

RCS-531-RA Radiation Tolerant Gas Purged Color Camera

Colorado Inc. Model 446 Y-C Integration Memory Unit

PTE-400 Camera Positioning Unit

Remote Ballast Unit - six Remote Ballasts and Breakers

Explosion proof lighting - six Phillips 250W Metal Halide Lamps - six Appleton A-51

Light Fixtures - six Appleton AAGL-A2-BOR Light Globes

Local Control Unit - Pan/Tilt/Zoom/Camera

Local Control Unit - Fixed Camera

Local Control Panel - Pan/Tilt/Zoom/Camera

Local Control Panel - Fixed Camera

Master Control Unit - Pan/Tilt/Zoom/Camera - S-Video Character Generator Overlay

Master Control Unit - Fixed Camera

Auxiliary Control Unit - Pan/Tilt/Zoom/Camera

Auxiliary Control Unit - Fixed Camera

Video Monitor - Sanyo, Model VMC-7514, 14 inch Color Monitor

Video Recorder - Panasonic, S-VHS, Model AG-1970P

Time Lapse Recorder - Panasonic, S-VHS, Model AG-6730

Digital Color Video Printer - Image Master HC-1600A

Minimum and Maximum Camera Focal Distances Established:

RCS 531 Zoom Camera (22MM - 90MM Lens) -

Minimum Focal Length = < 3 ft.

Maximum Focal Length = > 55 ft

RCS 541 Fixed Camera (7.5MM Lens) -

48 Degrees Horizontal to Infinity

Minimum and Maximum Lighting Controller Settings Established:

Minimum Setting N/A Maximum Setting N/A

Resolution/Definition Results: Accept

Comments: N/A