S

MAR 23 2000

ENGINEERING DATA TRANSMITTAL

1. EDT 628095

2. To: (Receiving Organization) Distribution	3. From: (Originating Organization) Maintenance and Reliability Eng.	4. Related EDT No.: N/A
5. Proj./Prog./Dept./Div.: Waste Retrieval Project	6. Design Authority/Design Agent/Cog. Engr.: G. R. Tardiff	7. Purchase Order No.: N/A
8. Originator Remarks: For approval and release of shop test results. Approval for release also resolves exception 7 of ATP-260-002 Rev. A-0. An acceptance tilt range of 211 degrees was achieved as indicated in Rev. A-1, page 24.		9. Equip./Component No.: N/A
		10. System/Bldg./Facility: 241-AZ
		12. Major Assm. Dwg. No.: N/A
11. Receiver Remarks: ASQ CAT-EX TF-96-0690, Rev 2 RPC 3/23/00 Shop Test Results	11A. Design Baseline Document? ○ Yes ◉ No	13. Permit/Permit Application No.: N/A
		14. Required Response Date: ~~02/18/2000~~ N/A SMD 12-08-00

15. DATA TRANSMITTED

(A) Item No.	(B) Document/Drawing No.	(C) Sheet No.	(D) Rev. No.	(E) Title or Description of Data Transmitted	(F) Approval Designator	(G) Reason for Transmittal	(H) Originator Disposition	(I) Receiver Disposition
1	RPP-5640	-	0	241-AZ WT Color Video	Q	1	1	
				Camera System Shop				
				Acceptance Test Report				

16. KEY

Approval Designator (F)	Reason for Transmittal (G)		Disposition (H) & (I)	
E, S, Q, D OR N/A (See WHC-CM-3-5, Sec. 12.7)	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

17. SIGNATURE/DISTRIBUTION (See Approval Designator for required signatures)

(G) Reason	(H) Disp.	(J) Name	(K) Signature	(L) Date	(M) MSIN	(G) Reason	(H) Disp.	(J) Name	(K) Signature	(L) Date	(M) MSIN
1	1	Design Authority GR Tardiff	GR Tardiff	3/21/00	S5-05	1	2	JR Bellomy	JR Bellomy	3/14/00	R1-56
		Design Agent N/A				3		PA Werner			S5-15
1	1	Cog. Eng. D. A. Bragg	D A Bragg	3/21/00	S5-05	1	1	RV Gutierrez	R. Gutierrez	3/20/00	R5-03
1	1	Cog. Mgr. D. G. Baide	DG Baide	3-21-00	S5-05	1	1	SM Werry	SM Werry	3-21-00	R1-56
1	1	QA WL Adams	WL Adams		S6-15	3		TL Clarke (AI)			N1-29
1	1	Safety RS. FOGG	RS Fogg	3/22/00		3		J. E. Andrews			S5-04
		Env.				3		J. A. ANDERSEN			H1-19

18.	19.	20.	21. DOE APPROVAL (if required)
SM Werry 03-08-00 Signature of EDT Originator — Date	Authorized Representative for Receiving Organization — Date	GR Tardiff 3-21-00 Design Authority/ Cognizant Manager — Date	Ctrl No. N/A ○ Approved ○ Approved w/comments ○ Disapproved w/comments

BD-7400-172-1

BD-7400-172-2 (10/97)

241-AZ-101 Waste Tank Color Video Camera System Shop Acceptance Test Report

S.M. Werry
CH2MHill Hanford Group, Inc.
Richland, WA 99352
U.S. Department of Energy Contract DE-AC06-96RL13200

EDT/ECN: 628095 UC:
Org Code: 74600 Charge Code: 112447
B&R Code: EW02J119 Total Pages: 129

Key Words: Waste Tank, Color Video Camera System, AZ-101

Abstract: This report includes shop acceptance test results. The test was performed prior to installation at tank AZ-101. Both the camera system and camera purge system were originally sought and procured as a part of initial waste retrieval project W-151.

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: Document Control Services, P.O. Box 950, Mailstop H6-08, Richland WA 99352, Phone (509) 372-2420; Fax (509) 376-4989.

3/23/00
Release Approval Date

DATE: HANFORD RELEASE
STA: 4 ID: 2
MAR 23 2000
Release Stamp

Approved For Public Release

RPP-5640

Rev. 0

241-AZ-101 WASTE TANK COLOR VIDEO CAMERA SYSTEM SHOP ACCEPTANCE TEST REPORT

S. M. Werry

CH2MHill Hanford Group, Inc.
RPP Maintenance & Reliability Engineering

AZ-101 CAMERA SHOP ACCEPTANCE TEST REPORT

TABLE OF CONTENTS

1.0 INTRODUCTION 3

2.0 TEST EQUIPMENT DESCRIPTION AND TEST SUMMARY 3

2.1 EQUIPMENT DESCRIPTION 3

2.2 SUMMARY 3

3.0 TEST PROCESS 4

4.0 TEST CONCLUSIONS 5

5.0 ATTACHMENT 1 - TEST PERFORMANCE TABLE 6

6.0 ATTACHMENT 2 - ATP-260-002 REV. A-0, TEST PHASE 1 13

7.0 ATTACHMENT 3 - ATP-260-002 REV. A-0, TEST PHASE 2 55

8.0 ATTACHMENT 4 - ATP-260-002 REV. A-1, TEST PHASE 3 91

9.0 ATTACHMENT 5 - MACRO SCALE MEASUREMENTS USING CCTV MICROMETER, S. WERRY, D. DOUGLAS TO A. CARLSON, JANUARY, 2000 127

AZ-101 CAMERA SYSTEM SHOP ACCEPTANCE TEST REPORT

1.0 INTRODUCTION

During the months of December (1999) and January (2000), a Shop Acceptance Test was performed on the tank AZ-101 in tank camera and camera purge systems. Testing was performed at both the 2703E and 2715E facilities located in 200 East area. This report documents the results of the testing. A general overview of the imaging system and original developmental methodology is described in Engineering Task Plan WHC-SD-W151-ETP-001.

2.0 TEST EQUIPMENT DESCRIPTION AND TEST SUMMARY

2.1 Equipment Description

In calendar year 1995, a two camera and camera purge system were specified, designed, and procured for waste tank AZ-101 as a part of waste retrieval project W-151. The two camera system was designed to provide visual information for assessment of the upper dome space region within tank AZ-101 and in addition to monitoring dome intrusive activities within the tank. Both camera and mast assemblies include an upper junction box for cable and purge interfacing , flange adapter fixture, mast, pan & tilt, lights, and camera. The 550 camera was designed for weld inspection and is not a part of this test. The 551 camera used for this test is an overview type camera which provides a 22mm to 90mm zoom lensing capability. The system also includes a portable camera purge system which provides a NFPA type X purge in addition to camera cooling. The system, including both camera assemblies, was previously tested in July of 1996.

2.2 Summary

Since previous testing was performed 1996, new in tank viewing parameters were identified and a retest of the camera and purge system was requested. The restest focused first on, providing verification the RCS-551 overview camera design could capably meet the new in tank viewing requirements and second, an opportunity to ensure all of the camera system test processes followed were in alignment with the tank farm FSAR which was released earlier in 1999. The retest was performed in December of 1999 and the results are published herein.

3.0 TEST PROCESS

The test processes were performed in both the 2703 and the 2715 buildings located in the 200 East area. Prior to beginning the test, a series of simulated in tank fixtures and equipment were fabricated. During the test, the fixtures were placed at predetermined distances and positions for strategic location in relation to the camera and tank riser layout. Simulated internal tank environmental conditions were employed "as much as possible" during the test process. The test fixtures were placed and moved attempting to reflect minimum equipment deflection which may occur during operation of AZ-101 mixer pump operation. The test equipment fixtures consisted of a simulated carbon steel tank background fixture and three simulated in tank equipment target fixtures. The target equipment fixtures were placed between the camera and simulated in tank background test fixture while the 551 camera/mast assembly was suspended vertically using an overhead approximately 1.1 ton overhead lifting devise. The assembly was secured to a special test flange fixture which was temporarily located on the upper level structure of 2703 framework.

The test was conducted in three phases. During performance of the test, building lights were turned off simulating (as near as possible) the very dark ambient lighting conditions within tank AZ-101. Lighting was adjusted periodically as needed to accommodate both test personnel safety and assure camera system test lighting conditions remained as dark as possible. During each phase of the test, the simulated in tank test fixtures were moved in 1/32nd of an inch increments and measured both visually and electronically using a video micrometer. The results of the incremental movement testing and two final discretionary tests are provided in the attached test performance table (ref. attachment 1).

During test phase one (ref. attachment 2), some typographical errors and equipment exceptions were noted which warranted a retest. Test phase two (ref. attachment 3) corrected and resolved equipment exceptions noted in phase 1 while test procedure revision A-1 corrected the typographical errors. Test phase three (ref. attachment 4) was required in order to test a back up pan and tilt which was placed in service after the original pan and tilt unit failed. The failure cause, although not specifically identified, was traced to a dual system interface location and isolated. No problems were encountered with the replacement pan and tilt during testing. Since the camera system was originally a two camera dual phase design, continued operation based on a single phase (one specific camera) operation was unilaterally perceived as acceptable and testing was successfully completed. The failed pan and tilt was shipped back to the Vendor for repair, repaired, and is now maintained as a spare.

4.0 TEST CONCLUSIONS

At conclusion of acceptance testing, all parties involved in the shop acceptance test activity agreed the shop acceptance test was successful and approval signatures were garnered. This concurrence of approval, concludes the shop acceptance testing process for the AZ-101 camera and camera purge system. Upon release of the results in this test report, shop test procedure requirements as delineated in TWRS Administrative Procedure, IP-8042, are satisfied and the system is now ready for field installation and operational testing.. It should also be noted, Vista Engineering Technologies, provided input to the test measurement process and reviewed test results independently. Vistas' approval and noted conclusions are attached and can be found in section 9.0 ATTACHMENT 5.

3-10-00

S. M Werry
RPP Maintenance and Reliability Eng.

5.0 ATTACHMENT 1 - TEST PERFORMANCE TABLE

5.0 ATTACHMENT 1 - TEST PERFORMANCE TABLE

NOTE: For each of the tests performed, the Colorado Video Micrometer used was preset to 6.63". The micrometer is manually set by using a screwdriver to dial in a predetermined numerical value after visually positioning two vertical cursors. A single horizontal cursor is also provided. Due to 2703 building size limitations, tests 1 through 4 were conducted with the backdrop fixture at a distance of 41' - 2".

TEST 1						
FIXTURE DISTANCE	BACKDROP DISTANCE	SIMULATED OBJECT	TIME OF TEST	MINIMUM VISUALLY DETECTABLE MOVEMENT	MINIMUM MEASURABLE MOVEMENT	COMMENTS/NOTES
12' - 8"	41'- 2"	6" ALC	5:22 PM	N/A	N/A	The 5:22 PM, 5:25 PM, and 5:28 PM portions of this test section were conducted with the camera zoom lens at the maximum wide angle of view. The telephoto angle of view was originally perceived as not usable because it appeared to fully engulf and exceed the video monitor vertical linearity (right hand side). At approximately the 5:29 it became apparent that may not have actually been the case since a 2 3/8" test fixture (placed approximately in line with the right hand side of the target 6 5/8" ALC test fixture) was actually confused with what was originally perceived as the ALC right outer edge. A retest was performed after moving the 2 3/8" test fixture. During the second phase of this test a unique information gathering methodology was used in relation to the rest of the information gathering throughout the remainder of the test process. Rather than a series of 1/32" movements and subsequent measurements, a move to 15/16" then 1" followed the initial 1/32" incremental movement of the test fixture. This larger "let's see what we can actually see" relative to on screen movement/s (prior to moving in a 1/32 type pattern) pattern was perceived as the best way to begin the video and video micrometer measurement series.
			5:25 PM	N/A	N/A	
			5:38 PM	N/A	N/A	
			5:47 PM	N/A	N/A	
			5:50 PM	N/A	N/A	
			5:51 PM	1/32"	N/A	
			5:54 PM	15/16" & 1"	15/16" & 1"	
			5:59 PM	N/A	N/A	
			6:08 PM	1" (7.74)	1" (7.74)	

5.0 ATTACHMENT 1 - TEST PERFORMANCE TABLE

TEST 2						
FIXTURE DISTANCE	BACKDROP DISTANCE	SIMULATED OBJECT	TIME OF TEST	MINIMUM VISUALLY DETECTABLE MOVEMENT	MINIMUM MEASURABLE MOVEMENT	COMMENTS/NOTES
37'- 2"	41' - 2"	6" ALC	6:15 PM	N/A	N/A	At 6:27 the test engineer noted a piece of angle iron used to stabilized the backdrop fixture was actually casting a shadow on the right hand side of the ALC test fixture which made the 1/32" movement noted at 6:22 void and therefore not measurable. The backdrop fixture was subsequently moved allowing solid 1/8" measurement. At 6:40 time the micrometer was reset to 6.63" and a second set of measurements were taken using the right side vertical cursor.
			6:22 PM	1/32	N/A	
			6:27 PM	N/A	N/A	
			6:37 PM	1/8"	1/8" (6.82)	
			6:40 PM	N/A	N/A	
			6:47 PM	1/16"	1/16" (6.73)	
TEST 3						
26' - 0'	41' - 2"	6" ALC	7:10 PM	N/A	N/A	Set up to measure left side of test fixture. Fixture movement was discernable to the left however, the image appeared somewhat fuzzy or slightly out of focus to this side. The fixture was readjusted to an approximate 5/32" move to the right where the movement was then clearly visible and measured as shown.
			7:16 PM	1/32"(L)	N/A	
			7:19 PM	1/32"(L)	N/A	
			7:23 PM	1/16" (L)	N/A	
			7:30 PM	5/32" (R)	5/32" (6.74)	

5.0 ATTACHMENT 1 - TEST PERFORMANCE TABLE

TEST 4						
FIXTURE DISTANCE	BACKDROP DISTANCE	SIMULATED OBJECT	TIME OF TEST	MINIMUM VISUALLY DETECTABLE MOVEMENT	MINIMUM MEASURABLE MOVEMENT	COMMENTS/NOTES
20' - 6"	41' - 2"	6" ALC	7:42 PM	N/A	N/A	
			7:47 PM	1/32"	1/32" (6.69)	
			7:53 PM	1/16"	1/16" (6.74)	
TEST 5						
19' - 8"	31' - 0"	6" ALC	8:05 PM	1/32"	1/32" (6.68)	
			8:15 PM	1/16"	1/16" (6.71)	
TEST 6						
25' - 4"	36' - 9"	6" ALC	8:41 PM	1/32"	N/A	
			8:47 PM	1/16"	1/16" (6.71)	

5.0 ATTACHMENT 1 - TEST PERFORMANCE TABLE

TEST 7						
FIXTURE DISTANCE	BACKDROP DISTANCE	SIMULATED OBJECT	TIME OF TEST	MINIMUM VISUALLY DETECTABLE MOVEMENT	MINIMUM MEASURABLE MOVEMENT	COMMENTS/NOTES
23' - 7"	26' - 5"	6" ALC	9:00 PM	1/32"	N/A	
			9:14 PM	1/16"	N/A	
			9:15 PM	3/32"	3/32" (6.74)	
TEST 8						
27' - 3"	30' - 1"	6" ALC	9:27 PM	N/A	N/A	
			9:35 PM	N/A	N/A	
			9:37 PM	N/A	N/A	
			9:39 PM	1/16"	1/16" (6.71)	

5.0 ATTACHMENT 1 - TEST PERFORMANCE TABLE

TEST 9						
FIXTURE DISTANCE	BACKDROP DISTANCE	SIMULATED OBJECT	TIME OF TEST	MINIMUM VISUALLY DETECTABLE MOVEMENT	MINIMUM MEASURABLE MOVEMENT	COMMENTS/NOTES
33' - 7"	41' - 2"	6" ALC	9:48 PM	N/A	N/A	
			9:55 PM	N/A	N/A	
			10:00 PM	3/32"	3/32" (6.74)	

5.0 ATTACHMENT 1 - TEST PERFORMANCE TABLE

DESCRETIONARY TEST #1						
FIXTURE DISTANCE	BACKDROP DISTANCE	SIMULATED OBJECT	TIME OF TEST	MINIMUM VISUALLY DETECTABLE MOVEMENT	MINIMUM MEASURABLE MOVEMENT	COMMENTS/NOTES
		~~2" TC~~ 6" ALC	10:06 PM		6.63"	Tape measure placed next to ALC test fixture. Vertical right side cursor moved systematically in one inch increments as read from micrometer digital indicator. The micrometer seemed to coincide with on screen tape measure image until inches 10 and 11 where a slight increase was slightly evident on screen.
			10:07 PM		7.63"	
			10:08 PM		8.63"	
			10:09 PM		9.63"	
			10:10 PM		10.63"	
			10:10 PM		11.66"	
DESCRETIONARY TEST #2						
		2" TC	10:12 PM		2.33"	Randomly placed thermocouple test fixture placed in test viewing range and measured with micrometer preset at 6.63" (ALC preset for tests 2 through 9)

6.0 ATTACHMENT 2 - ATP-260-002 REV. A-0, TEST PHASE 1

RPP-5640 REV. 0

241-AZ WASTE TANK COLOR VIDEO CAMERA SYSTEM SHOP ACCEPTANCE TEST PROCEDURE

Last Full Revision: A-0
Release Date: 12/08/99
USQ Screening Number: N/A
Approval Designator: SQ

Current Modification: A-0
USQ Screening Number: N/A
Approval Designator: SQ
PCA Incorporated: N/A

POSITION/ORG	DELEGATE	DATE
[illegible]/WTF	Vicki Miller	12/7/99
	R. Gutierrez	12/8/99
QA/QC	W.L. Adams	12/8/99
SAFTEY	Ernie Hurst	12/8/99
TWRS Rad Con	Bob Brown	12/8/99
Enviornmental	T.A. Dilhoff	12/8/99
Cog Eng/DST	Gary Tardiff	12/7/99
Cog Equip. Eng.	R. Robinson	12/8/99
Acceptance Review	David W. VanDyke	12/8/99
Approval Authority	James Bryce	12/8/99

Justification: New Procedure.

Summary of Changes:
N/A

14

TABLE OF CONTENTS

PAGE

TEST EXECUTION SHEET 3

1.0 PURPOSE AND SCOPE 4
1.1 PURPOSE 4
1.2 SCOPE 4

2.0 INFORMATION 4
2.1 TERMS AND DEFINITIONS 4
2.2 RESPONSIBILITIES 4
2.3 REFERENCES 6
2.4 RECORDS 6

3.0 PRECAUTIONS AND LIMITATIONS 7
3.1 PERSONNEL SAFETY 7

4.0 PREREQUISITES 8
4.1 SPECIAL TOOLS, EQUIPMENT, AND SUPPLIES 8
4.2 CONDITIONS AND ACTIONS 9

5.0 PROCEDURE 10
5.1 START UP AND PURGE SYSTEM TEST 10
5.2 PURGE CONTROL SYSTEM AND DIFFERENTIAL PRESSURE SWITCH TEST . . 13
5.3 RCS-551 CAMERA UNIT 17
5.4 RCS-551 PAN AND TILT 19
5.5 DETECTION OF MOVEMENT TEST 21

SPECIFIED TESTING TABLE 23

DISCRETIONARY TESTING TABLE 24

FIGURE 1 25

FIGURE 2 26

ATP PERFORMANCE LOG 27

ATP EXCEPTION LOG 28

ATP EXCEPTION RECORD 29

PROCEDURE SIGNATURE SHEET 30

PROCEDURE HISTORY SIGNATURE SHEET 31

TEST EXECUTION SHEET

DATE: 1/19/2000	DOCUMENT NUMBER: ATP-260-002
DOCUMENT TITLE: 241-AZ WASTE TANK COLOR VIDEO CAMERA SYSTEM SHOP ACCEPTANCE TEST PROCEDURE	
TEST PERSONNEL (PRINT NAMES)	
TEST DIRECTOR: RICH GUTIERREZ	RECORDER: RICH GUTIERREZ
OPERATIONS ENGINEER: RICH GUTIERREZ	
TEST EXECUTION	
TEST DIRECTOR SIGNATURE/DATE: R. Gutierrez 1/19/2000	TEST ENGINEER SIGNATURE/DATE: SM Wang 1-19-00
OPERATIONS ENGINEER SIGNATURE/DATE: R. Gutierrez 1/19/2000	RECORDER SIGNATURE/DATE: R. Gutierrez 1/19/2000
APPROVAL AND ACCEPTANCE OF TEST RESULTS	
WITHOUT EXCEPTION ✓ (✓)	WITH EXCEPTIONS RESOLVED ____ (✓) WITH EXCEPTIONS REMAINING ____ (✓)
TEST DIRECTOR SIGNATURE/DATE: R. Gutierrez 1/19/2000	PROJECT MANAGER SIGNATURE/DATE: JRB 1/20/00
TEST ENGINEER SIGNATURE/DATE: SM Wang 1-19-00	QUALITY ASSURANCE SIGNATURE/DATE: WL Adams 1/19/2000
DESIGN AUTHORITY SIGNATURE/DATE: Daryl Sudy 1-19-00	OPERATIONS ENGINEER SIGNATURE/DATE: R. Gutierrez 1/19/2000
AUTHORIZED INSPECTOR SIGNATURE/DATE: G L Clarke 1-20-00	

1.0 PURPOSE AND SCOPE

1.1 PURPOSE

This procedure provides instructions to performing a Shop Acceptance Test Procedure for the 101 AZ camera system and camera purge gas (air) system.

1.2 SCOPE

This procedure shall demonstrate and document acceptance of the 241-AZ-101 Waste Tank Color Video Camera System, camera purge gas (air) system, and provides verification they function as designed.

The purge system functions will be tested verifying pressure and flow exists during camera system operation.

The purge control system functions will also be tested verifying automatic shutdown of in tank assemblies and electrical components is achieved upon loss of pressure. Functionality of differential pressure switches for operability and redundancy to show no single point failure exists in electrical shutdown system.

2.0 INFORMATION

2.1 TERMS AND DEFINITIONS

2.1.1 ALARA - As Low As Reasonably Achievable

2.2 RESPONSIBILITIES

2.2.1 Test Engineer is responsible for the following:

- All preparations for this Test have been completed
- Support Test Director and Test Personnel with the technical information and support necessary to complete this procedure

2.2.2 Operation Personnel are responsible for operating the camera systems per the Test Engineer and Test directors direction.

2.2 RESPONSIBILITIES (cont.)

2.2.3 Test Director is responsible for the following:

- Obtaining required signatures on the Test Procedure Working Copy prior to reproduction and distribution
- The safe, efficient, and productive performance of the test
- Coordination of all testing activities
- Signing the Acceptance Test Procedure Exception Record when a test exception has been resolved
- Preparing and issuing an Acceptance Test Report for the approved, accepted and completed Test Procedure
- Scheduling and conducting a pre-test meeting with test participants
- Notification of the persons performing and witnessing the test prior to the start of testing
- Notification of all involved test personnel when a change is made in the testing schedule
- Act as liaison between the participants involved with the testing
- Stopping any test or section which may cause damage to the system
- Approving field changes to the Test Procedure in accordance with Section 2.5.3
- Obtaining revisions to the Test Procedure, to comply with authorized field changes or to accommodate existing field conditions in accordance with Section 2.5.3
- Taking actions to resolve exceptions to the Test Procedure
- Evaluating recorded data, discrepancies, and exceptions
- Signing Test Execution Sheet when this Test Procedure has been performed
- Signing Exception Record when a retest to clear an exception has been executed and accepted

2.2 RESPONSIBILITIES (cont.)

2.2.4 QC Inspector is responsible for witnessing test execution and signing the completed sections of the test.

2.2.5 The Authorized Inspector is responsible for the following:

- Witnessing test execution
- Approval and signature of acceptance upon completion of this procedure.

2.2.6 Operations Engineer is responsible for witness test execution and sign acceptance upon completion of procedure.

2.3 REFERENCES

2.3.1 Acceptance Test Report 241-AZ-101 Waste Tank Color Video Camera System WHC-SD-WM-ATR-181 Rev 0

2.3.2 Purchase Specification WHC-S-0410, Rev 2 (P.O.# W-408171), "241-AZ-101, W151 Project, Suspended Fixture and Weld Inspection Camera System."

2.3.3 WHC-SD-W151-ETP-001, Rev. 1, "Engineering Task Plan for The 241-AZ-101 Waste Tank Color Video Camera System".

2.3.4 WHC-SD-WM-ATP-181, Rev. 0, "Acceptance Test Procedure 241-AZ-101 Waste Tank Color Video Camera System".

2.4 RECORDS

2.4.1 All personnel involved in the performance of this test shall sign in Procedure Signature Sheet.

2.4.2 Test results shall be recorded by the Test Engineer. All entries into this test procedure shall be made in black ink. Unless specific data is required, the signature or initials as applicable, 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 2.5 EXCEPTIONS. A complete working copy of this procedure and any exception records generated shall be maintained as a permanent record.

2.4 RECORDS (Cont).

2.4.3 An Exception Log and Exception Record sheet is attached in the event exceptions to the test are made when the test is being performed. All exceptions to the test are to be dispositioned and agreed to by all witnesses. Actions taken regarding disposition are noted on the exception sheet. During the performance of this test, errors in test may be encountered which require correction/adjustment to complete the test. Such corrections are to be noted in the ATP and listed as an exception.

3.0 PRECAUTIONS AND LIMITATIONS

3.1 PERSONNEL SAFETY

3.1.1 If the performance of this procedure is suspended for any reason, ensure the equipment is left in a safe state.

3.1.2 All lockouts and tagouts or over-tagging requirements shall be performed in accordance with Tank Farm Administration Manual, HNF-IP-0842, Vol II, Section 4.9.1.

3.1.3 If any equipment problem is observed during the performance of this procedure, immediately notify the Test Director.

3.1.4 All fittings and safety devices such as whips and clamps pertaining to the compressed air system and associated hoses, SHALL be inspected prior to valving in the air.

3.1.5 Proper lifting techniques shall be utilized throughout the procedure and personnel shall take precautions to ensure back strain, pinchpoints and protective clothing are observed.

4.0 PREREQUISITES

4.1 SPECIAL TOOLS, EQUIPMENT, AND SUPPLIES

The following supplies may be needed to perform this procedure:

4.1.1 • Flowmeter (Per Test Engineer)

4.1.2 • Stopwatch

4.1.3 CAMERA ASSEMBLY SYSTEM

- Camera Mast
- Pan And Tilt Unit
- Overview Camera
- Two 75 watt halogen lights

4.1.4 FIELD UNITS

- Local Interface Unit
- Hazardous Location Control Panel
- Mobile Air Compressor

4.2 SPECIAL TOOLS, EQUIPMENT, AND SUPPLIES (Cont).

4.1.5 CAMERA CONTROLS

- Camera, Pan and Tilt, and Lighting Controls
- S Video Color Video Monitor
- Keyboard
- VCR and videotape
- Misc. optional video measurement and enhancement equipment.

4.1.6 TEST FIXTURES

- Lifting Adapters / Adapters
- Simulated In Tank Components

4.2 CONDITIONS AND ACTIONS

4.2.1 **ENSURE** all test personnel have been briefed on the hazards and responsibilities including a Job Hazard Analysis prior to performing this test.

R. Gutierrez 12-10-99
Test Director Signature Date

Rich Gutierrez
Test Director Print Name

4.2.2 **VERIFY** the camera, and camera purge (air) systems are completely assembled.

R. Gutierrez 12-10-99
Test Director Signature Date

Rich Gutierrez
Test Director Print Name

4.2.3 QC Witness sign below verifying that instrumentation listed below has been calibrated and a current calibration sticker is affixed.

- Flowmeter (0.5-4 cfm) OR acceptable substitute per Test Engineer.

ID Number: 545-28-13-057

Cal. Due Date: 1-4-00

K. Willoughby 12/10/99
QC Signature Date

K. Willoughby
QC Print Name

5.0 PROCEDURE

Exception 02 RG 12/10/99

NOTE - Two control units need to be tested prior to installation in the field. Sections 1.0 - 5.5 may be copied, enabling test personnel to perform testing of additional control systems. All pertinent Record Sheets of this procedure may be copied as well, enabling capture of ID. numbers, test exception, resolution and other test data. All safety precautions and controls will be re-verified and re-signed for each set of camera system controls tested. Section 5.6 need only be tested on one control system.

NOTE - The total volume for the camera and mast assembly (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 Relays (TDRs) located in the Hazardous Location Power Controller are pre-set 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. Adjustments to time delay relays may be necessary during the testing based on flow measurements obtained. (Ref. step 5.2.3)

5.1 START UP AND PURGE SYSTEM TEST

5.1.1 **ASSEMBLE** Camera system components per test directors direction.

5.1.2 **TURN ON** purge air compressor system to a range of 15-25 psig, allowing purge air to flow through all paths.

5.1.3 **CHECK** each suspect fitting or leak path for any significant leakage as determined by Test Engineer, in purge system, with "SNOOP" or other approved method as directed by Test Director.

5.1.4 **REPAIR OR FIX** any leaks as necessary

5.1 START UP AND PURGE SYSTEM TEST (Cont).

5.1.5 **VERIFY** Purge path is acceptable for testing.

R. Gutierrez 12-10-99
Test Director Signature Date

R. Gutierrez
Test Director Print Name

5.1.6 **POSITION** the Hazardous Location Power Controller unit to the "ON" position **AND**

Begin **TIMING** purge system cycle.

5.1.7 **ENSURE** the POWER indicating lamp is illuminated.

5.1.8 **ENSURE** purge supply is allowing flow through Hazardous Location Power Controller.

5.1.9 **ENSURE** the FLOW indicating lamp is illuminated.

5.1.10 **ENSURE** the PRESSURE 1 indicating lamp is illuminated.

5.1.11 **ENSURE** the PRESSURE 2 indicating lamp is illuminated.

5.1.12 AFTER Purge cycle completes, **ENSURE** ENERGIZED indicator is illuminated **AND**

STOP timing purge system cycle.

5.1.13 **RECORD** cycle time below.

11 minutes RG

5.1 START UP AND PURGE SYSTEM TEST (Cont).

Exception 03 RG 12/10/99 5.1.14 ~~Manually~~ momentarily **KINK** the purge supply hose to the camera cutting off flow.

5.1.15 **VERIFY** that system power down occurs after purge flow is interrupted, and ENERGIZED, PRESSURE 1 and PRESSURE 2 indicator lights located on the Hazardous Location Power Controller are no longer illuminated.

R. Gutierrez — 12-10-99
Test Director Signature — Date

R. Gutierrez
Test Director Print Name

5.1.16 **VERIFY** section 5.1 is complete.

R. Gutierrez — 12-10-99
Test Director Signature — Date

R. Gutierrez
Test Director Print Name

* K. Willoughby — 12/10/99
QC Signature — Date

K. WILLOUGHBY
QC Print Name

* SEE EXCEPTION #S 2, 3 KW 12/10/99

5.2 PURGE CONTROL SYSTEM AND DIFFERENTIAL PRESSURE SWITCH TEST

5.2.1 **PLACE** a flowmeter (0.5 - 4.0 cfm range or acceptable equivalent) in-line with the purge air output side of the pressure relief valve, located on camera assembly light housing.

5.2.2 **ENSURE** toggle switches on the differential pressure switch test box are in the ENABLE position.

See Exception #2 & #3 R. Gutierrez 12/10/99

5.2.3 Ensure ~~**PLACE**~~ differential pressure switch test box inline with connector J4 (Ref Fig. 2) located on the rear of the Hazardous Location Power Controller and connector ~~35~~ 39 located on the bottom of the local interface unit.

Exception 03 RG 12/10/99

5.2.4 Ensure ~~**TURN ON**~~ the purge air supply is on **AND**

PRESS the START/RESET button located on the Hazardous Location Power Controller.

5.2.5 **RECORD** the flowrate taken from the flowmeter.

Flow Rate 1.25 cfm

Exception 04 RG 12/10/99

5.2.6 **VERIFY** flowrate is 1.5 cfm or greater.

R. Gutierrez 12-10-99
Test Director Signature Date

R. Gutierrez
Test Director ~~Print~~ Name

5.2.7 **TURN OFF** purge air supply.

5.2.8 **REMOVE** flowmeter from system.

5.2.9 **TURN ON** purge air supply **AND**

PRESS the START/RESET button located on the Hazardous Location Power Controller.

5.2 PURGE CONTROL SYSTEM AND DIFFERENTIAL PRESSURE SWITCH TEST (Cont).

Exception 03 RG

5.2.10 **ENSURE** PURGING indicator is illuminated.

After Purge cycle completes,

5.2.11 **ENSURE** ENERGIZED, PRESSURE 1, PRESSURE 2, and FLOW indicators are illuminated.

5.2.12 **POSITION** PRESSURE 1 located on the test switch box, to the DISABLE position **AND**

VERIFY camera control and lighting system power is disabled.

R. Gutierrez 12-10-99
Test Director Signature Date

R. Gutierrez
Test Director Print Name

5.2.13 **POSITION** PRESSURE 1 to the "ENABLE" position.

5.2.14 **PRESS** the "START/RESET" button **AND**

ENSURE PURGING indicator is illuminated.

5.2.15 AFTER Purge cycle completes, **ENSURE** ENERGIZED, PRESSURE 1, PRESSURE 2, and flow indicators are illuminated.

5.2.16 **POSITION** PRESSURE 2 located on the test switch box, to the "DISABLE" position **AND**

VERIFY camera control and lighting system power is disabled.

R. Gutierrez 12-10-99
Test Director Signature Date

R Gutierrez
Test Director Print Name

5.2 PURGE CONTROL SYSTEM AND DIFFERENTIAL PRESSURE SWITCH TEST (Cont).

5.2.17 **ATTEMPT** to reenergize system with PRESSURE 2 in the "DISABLED" position.

5.2.18 **VERIFY** Hazardous Location Power Controller will NOT allow camera control and lighting system to energize.

R. Gutierrez 12-10-99
Test Director Signature Date

R. Gutierrez
Test Director Print Name

5.2.19 **POSITION** PRESSURE 2 to the "ENABLE" position.

5.2.20 **POSITION** PRESSURE 1 to the "DISABLE" position **AND**

VERIFY camera control and lighting system power is disabled.

R. Gutierrez 12-10-99
Test Director Signature Date

R. Gutierrez
Test Director Print Name

5.2 PURGE CONTROL SYSTEM AND DIFFERENTIAL PRESSURE SWITCH TEST (Cont).

5.2.21 **ATTEMPT** to reenergize system with PRESSURE 1 in the "DISABLED" position.

5.2.22 **VERIFY** Hazardous Location Power Controller will NOT allow camera system to energize.

R Gutierrez — 12-10-99
Test Director Signature — Date

R. Gutierrez
Test Director Print Name

5.2.23 **REMOVE** Test Switch Box from system **AND**

RECONNECT J4 Cables.

5.2.24 **VERIFY** Section 5.2 is complete.

R. Gutierrez — 12-10-99
Test Director Signature — Date

R. Gutierrez
Test Director Print Name

* Ken Willoughby — 12/10/99
QC Signature — Date

K. Willoughby
QC Print Name

* SEE EXCEPTIONS 2,3,4 KW 12/10/99

Exception 05 [illegible] RG [illegible]

5.3 RCS-551 CAMERA UNIT

5.3.1 **RECORD** serial number of camera control unit.

Serial Number: 000625

NOTE - During this portion of the test the Test Engineer shall verify each camera control is satisfactory and will then initial the space provided for each step.

SMW 5.3.2 **PLUG** the video monitor and video recorder into the power source.

SMW 5.3.3 **VERIFY** the video monitor and video recorder are operational.

SMW 5.3.4 Using remote camera zoom control, manipulate the zoom control to wide angle.

SMW 5.3.5 **VERIFY** the zoom moves towards wide when operated towards "wide".

SMW 5.3.6 **MANIPULATE** the zoom control to telephoto.

SMW 5.3.7 **VERIFY** the zoom moves towards telephoto when operated towards "telephoto".

SMW 5.3.8 **MANIPULATE** the iris control to fully open.

SMW 5.3.9 **VERIFY** the iris moves towards open when operated towards open.

SMW 5.3.10 **MANIPULATE** the iris control to the fully closed position.

SMW 5.3.11 **VERIFY** the iris moves towards the closed position when operated to the closed position.

SMW 5.3.12 Using the near focus control, **VERIFY** that the focus adjusts to near when focused on an object that is "near".

SMW 5.3.13 Using the far focus control, **VERIFY** that the focus adjusts to far when focused on an object that is "far".

5.3 RCS-551 CAMERA UNIT (Cont).

SMD 5.3.14 **START** Video Tape Recording.

SMD 5.3.15 While the camera is focused on an object, **VERIFY** that the picture is free of image defects such as ghost images, picture lag, distortion, hum, or smearing.

SMD 5.3.16 **PLAY BACK** the previously recorded taping of the resolution test.

SMD 5.3.17 **VERIFY** that the video recorder operates properly and that the image is acceptable.

5.3.18 **VERIFY** Section 5.3 is complete.

R. Gutierrez — 12-10-99
Test Director Signature — Date

R. Gutierrez
Test Director Print Name

* [signature] — 12-10-99
QC Signature — Date

K. WILLOUGHBY
QC Print Name

* SEE EXCEPTION # 5 KW 12/10/99

5.4 RCS-551 PAN AND TILT

NOTE - During this portion of the test the Test Engineer shall VERIFY each pan and tilt control is satisfactory and will then initial in the space provided for each step.

SMW 5.4.1 Using the remote pan control, pan in the clockwise direction until stop is reached.

SMW 5.4.2 **RECORD** the encoder readout for the position of the camera.

Encoder reading: 358 degrees

SMW 5.4.3 **PAN** in the counterclockwise direction until stop is reached.

SMW 5.4.4 **RECORD** the encoder readout.

Encoder reading: 600 degrees

SMW 5.4.5 **VERIFY**, using the readings from step 5.4.1 - 5.4.4 that the panning operation has covered 358 degrees.

Overall reading: 358 degrees

SMW 5.4.6 **TILT** the camera downward until the electronic stop position is reached.

SMW 5.4.7 **RECORD** the encoder readout.

Encoder reading: 239 degrees

Exception 06 RG 12/10/99 SMW 5.4.8 **TILT** the camera up to the extreme upward position until the electronic stop position is reached.

SMW 5.4.9 **RECORD** the encoder readout.

Encoder reading: * 40 degrees

* manually stopped at 40 degrees. R. Sutherland 12/10/99

5.4 RCS-551 PAN AND TILT (Cont).

Exception #7 RG 12/10/99

SMW 5.4.10 **VERIFY** using the encoder readings from steps 5.4.6 - 5.4.9 that the tilt has a range of 200 degrees min.

Overall reading: 199 degrees

SMW 5.4.11 **DE-ENERGIZE** the pan and tilt unit.

SMW 5.4.12 **VERIFY** that the pan and tilt maintains it's position.

SMW 5.4.13 **VERIFY** Section 5.4 is complete.

R. Gutierrez — 12-10-99
Test Director Signature — Date

R. Gutierrez
Test Director Print Name

* Ken Willoughby — 12/10/99
QC Signature — Date

K. Willoughby
QC Print Name

* SEE EXCEPTIONS # 6, 7. KW 12-10-99

5.5 DETECTION OF MOVEMENT TEST

NOTE - Two types of tests will be performed and data shall be recorded on either the Specified Testing Table OR the Discretionary Testing Table. The objective in this test section is to determine the minimum detectable movement, at various distances, with the camera system. Adjustments such as lighting changes, camera adjustments etc. may be done at anytime during this section as directed by Test Director.

exception 03 RG 12/10/99

5.5.1 ENSURE ~~**POSITION**~~ the Hazardous Location Power Controller unit to the "ON" position **AND**

ENSURE POWER indicator is illuminated.

5.5.2 **ENSURE** purge supply is allowing flow through Hazardous Location Power Controller.

exception 08 RG 12/10/99

5.5.3 ~~**PRESS** the "START/RESET" button **AND**~~

ENSURE PURGING indicator is illuminated.

exception 09 RG 12/10/99

5.5.4 ~~AFTER Purge cycle completes,~~ **ENSURE** ENERGIZED indicator is illuminated.

5.5.5 **RECORD** Test Date, and Camera system ID. number on applicable Testing Table.

5.5.6 **PLACE** a simulated dark background, carbon steel plate or other similar background as approved by Test director, a measured distance from the camera, **AND**

exception 03 RG 12/10/99

as required, **RECORD** distance on applicable Test Table.

5.5.7 **PLACE** a simulated in-tank assembly BETWEEN the camera and the simulated background **AND**

exception 03 RG 12/10/99

as required **RECORD** component size, and distance on applicable Test Table.

5.5.8 **ELIMINATE** All non-camera light sources as completely as possible, **AND**

RECORD any light sources still present on the Performance Log.

5.5.9 **FOCUS** camera on simulated assembly.

5.5 DETECTION OF MOVEMENT TEST (Cont).

5.5.10 **MOVE** simulated assembly in 1/32" increments, until camera operator detects movement.

5.5.11 **RECORD** the distance moved on applicable Test Table.

5.5.12 **RECORD** any special camera adjustments, lighting changes, or any comments on applicable Test Table.

5.5.13 **REPEAT** steps 5.5.7 - 5.5.12 as directed by Test Director to determine minimum movement detectable.

5.5.14 **VERIFY** Section 5.5 is complete.

R. Gutierrez — 12-10-99
Test Director Signature — Date

R. Gutierrez
Test Director Print Name

* K.W. Willoughby — 12-10-99
QC Signature — Date

K. WILLOUGHBY
QC Print Name

* SEE EXCEPTIONS 3, 8, 9, 10 KW 12-10-99

CAMERA SYSTEM ID NUMBER AZ-101-WST-TV-301

DATE 12-10-99

AZ-101 CAMERA COMPONENT DISPLACEMENT / RESOLUTION TESTING SPECIFIED TESTING TABLE

Test Number	Date/Time	Distance To: Background	Distance To: Component	Component Diameter	Minimum Distance Detected	Lighting Configuration	Comments
S-001	12-10-99/1630	39' 10"	12' 8"	6 5/8"	1/32"	Room darkened	ALC-2 Safety shower light on (Green)
S-002	12-10-99/1910	*41' 2" ~~49' 4"~~	26' 0"	6 5/8"	5/32"	Room darkened	ALC-5 Safety shower light on (Green)
S-003	12/10/99/1941	*41' 2" ~~45' 5"~~	20' 6"	6 5/8"	1/32"	Room darkened	ALC-6 Safety shower light on (Green)
S-004	12-10-99/2005	31' 0"	19' 8"	6 5/8"	1/32"	Room darkened	ALC-10 Safety shower light on (Green)
S-005	12-10-99/2045	36' 9"	25' 4"	6 5/8"	1/32"	Room darkened	ALC-11 Safety shower light on (Green)
S-006	12/10/99/1825	*41' 2" ~~47' 10"~~	37' 2"	6 5/8"	1/16"	Room darkened	ALC-17 Safety shower light on (Green)
S-007	12-10-99/2145	*41' 2" ~~44' 7"~~	33' 7"	6 5/8"	1/32"	Room darkened	ALC-18 Safety shower light on (Green)
S-008	12-10-99/2103	26' 5"	23' 7"	6 5/8"	1/32"	Room darkened	T/C-15E Safety shower light on (Green)
S-009	12-10-99/2125	30' 1"	27' 3"	6 5/8"	1/16"	Room darkened	T/C-15F Safety shower light on (Green)
		50' 0"	5' 0"				
		50' 0"	10' 0"				
		50' 0"	20' 0"				
		50' 0"	30' 0"				
		50' 0"	40' 0"				

* Exception #10 RG 12-10-99

36

RPP-5640 REV. 0

CAMERA SYSTEM ID NUMBER _____

DATE _____

AZ-101 CAMERA COMPONENT DISPLACEMENT / RESOLUTION TESTING
DISCRETIONARY TESTING TABLE

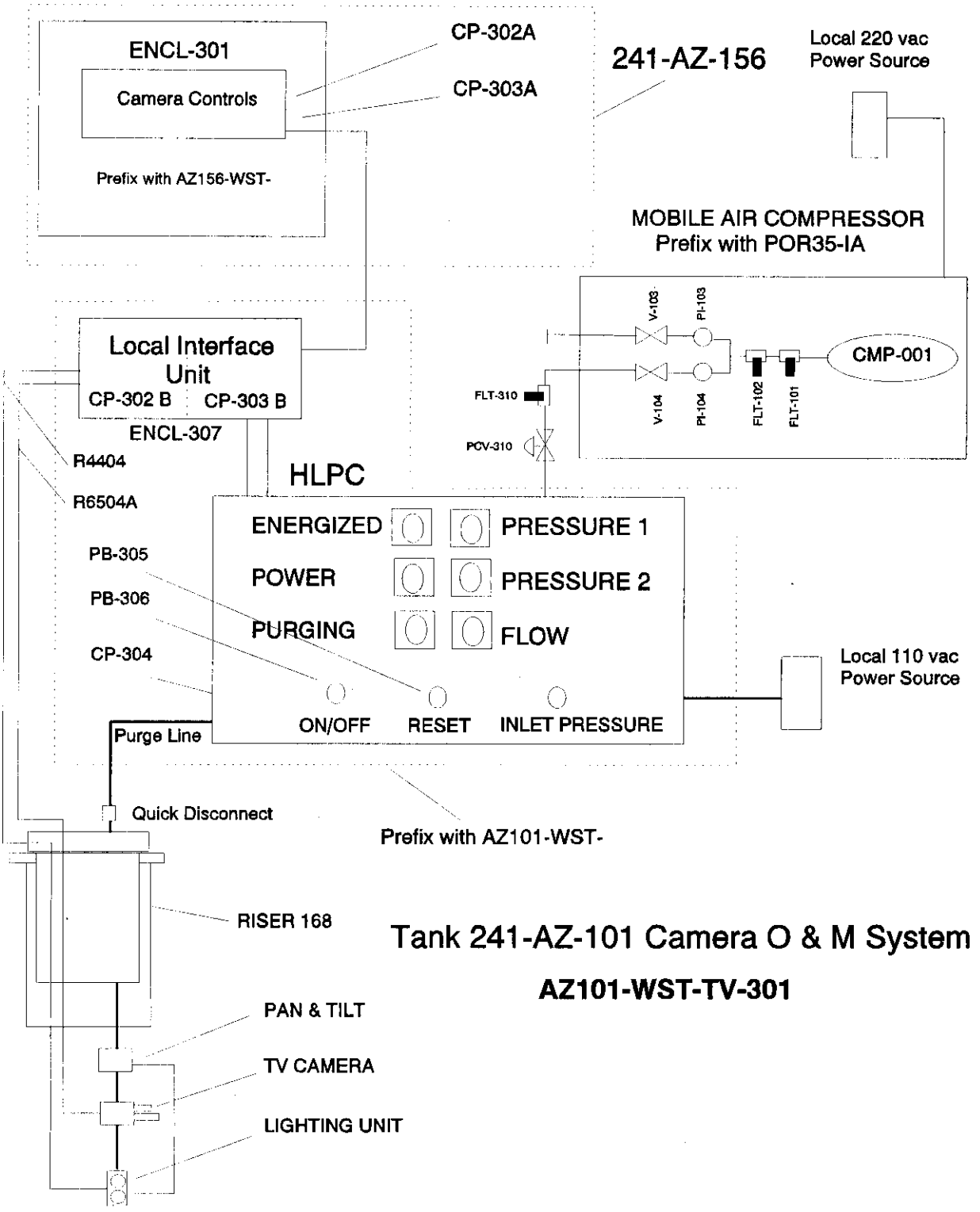
Test Number	Date/Time	Distance To		Component Diameter	Minimum Distance Detected	Lighting Configuration	Comments
		Background	Component				
D-							
D-							
D-							
D-					(1)		
D-							
D-							
D-							
D-							
D-							

(1) Reference 5.0 attachment 1 for discretionary Testing data.

37

RPP-5640 REV. 0

FIGURE 1



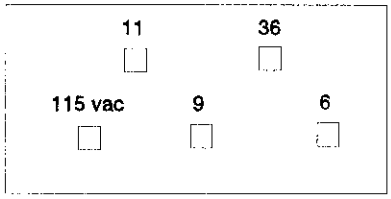
Tank 241-AZ-101 Camera O & M System

AZ101-WST-TV-301

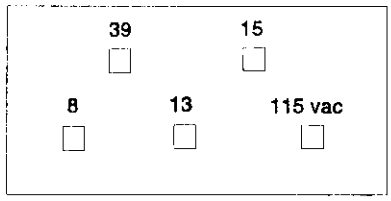
FIGURE 2

LOCAL INTERFACE UNIT ENCLOSURE
AZ101-WST-ENCL-307

AZ101-WST-CP-302B



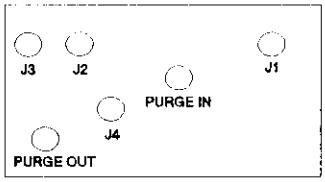
AZ101-WST-CP-303B



#11 Mate to 302 B Mast Jnct. Box (TV-301)
#36 Mate to 302 B Gas Monitoring (CP-304)
#9 Mate to 302 B Mast Jnct. Box (TV-301)
#6 Mate to CP-302 A (Ref. Fig. 1)
115 vac to Gas Monitoring System

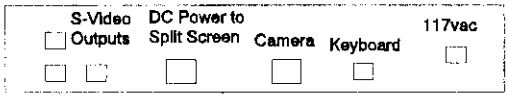
#15 Mate to 303 B Mast Jnct. Box (TV-301)
#39 Mate to 303 B Gas Monitoring (CP-304)
#13 Mate to 303 B Mast Jnct. Box (TV-301)
#8 Mate to CP-303 A (Ref. Fig. 1)
115 vac to Gas Monitoring System

HAZARDOUS LOCATION POWER CONTROLLER
(HLPC)

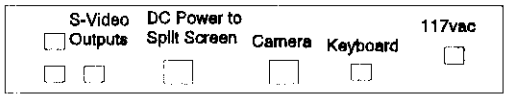


AZ101-WST-CP-304

AZ156-WST-ENCL-301
CAMERA CONTROL UNIT REAR PANEL



AZ156-WST-CP-302A



AZ156-WST-CP-302B

UPPER CAMERA AZ101-WST-TV-301

ATP PERFORMANCE LOG

This page may be reproduced as necessary. Page 1 of _____

ATP PERFORMANCE EVENT	DATE	INITIALS
Performed pre-job at 2703 Bldg discussed	12/10/99	RG
safety Hazards in the shop, reviewed roles and		
responsibilities.		
Local Interface Unit Enclosure is a dual system		
AZ-101-WST-CP-302B and AZ-101-WST-CP-303B,		
302B is Faulty, we hooked up to 303B and started		
this ATP test. Local Interface Unit Enclosure		
was not labeled, according to ATP-260-002.		
Safety shower lights (green) still illuminated		
1630 — Set up A riser (6 5/8" diameter) 12'8" from		
camera. Set up Riser (2" dia) 23'6" from		
camera.		
1712 — Test 1B started S-001/ALC-2 moved 1/32", some movement was		
observed. 1730 — moved 1/32" ~~Test 2~~ 1825 — Specified testing Table		
Test number S-006 was changed background distance		
from 47'10" to 41'2". Component distance is at		
37'2". ~~TEST 3~~ 1910: Test # S-002 background at 41'2", component		
is at 26'0". Moved Riser 3/32" to the left, no visual movement noticed.		
Moved Riser 1/16", noticed movement. Test 4, 1944: S-003 background at		
41'2", Component at 20'6". 1947 Riser moved 1/32" to the right, noticed a .06		movement.
Moved riser 1/32 to the right.	12/10/99	RG

ATP PERFORMANCE LOG

This page may be reproduced as necessary. Page 2 of ____

ATP PERFORMANCE EVENT	DATE	INITIALS
TEST 5: 2005 Test # S-004 background at 31'0", Component at 19'8'		
moved component 1/32" to right, noticed movement of .05, Moved another 1/32		
to the right, noticed movement		
TEST 6: 2045 test# S-005, background at 36'9", Component at 25'4"		
moved 1/32" noticed movement, not measurable, moved another 1/32" noticed a little movement.		
measured at .09.		
TEST 7: 2103 Test# S-008 background at 26'5", Component at 23'7".		
moved 1/32" - noticed movement, not measurable, moved another 1/32", move another 1/32" measured		
at .09.		
TEST 8: 2125 Test # S-009 background at 30'1", Component at 27'3".		
moved 1/32" no noticeable movement, moved another 1/32" detected movement, moved		
another 1/32", measured:		
TEST 9: 2145 Test# S-007 background at 41'2", due to ship space,		
component at 33'7". moved 1/32" detectable - not measurable. moved		
another 1/32" detectable not measurable moved another 1/32" measured at		
.07.		

ATP EXCEPTION LOG

This page may be reproduced as necessary. Page 1 of ____

Number	Date	Description
01	12/10/99	TEST EXECUTION SHEET, delete Operations Engineer Signature/Date. Not required for ATP.
02	12/10/99	Local Interface Unit Enclosure. One side of enclosure not working.
03	12/10/99	Editorial changes
04	12/10/99	Step 5.2.5 not able to obtain required flow
05	12/10/99	step ~~5.0~~ 5.3 RT 12/10/99 purge system needed to be operating prior to start camma system.
06	12/10/99	5.4.8 electronic stop position was not reached
07	12/10/99	5.4.10 unable to reach 200 degrees minimum due to manually stopping upward tilt.
08	12/10/99	5.5.3 deleting part of step, Purge air system already running.
09	12/10/99	5.5.4. deleting part of step, Purge air system already running
10	12/10/99	SPECIFIED TESTING TABLE page 23. Background distances not achievable due to shop space.

ATP EXCEPTION RECORD

This page may be reproduced as necessary. Page 1 of _____

ATP STEP NUMBER: ~~5.2.3~~ RG	ATP EXCEPTION LOG#: 01

DESCRIPTION OF EXCEPTION: ~~Local Interface Unit Enclosure~~ RG

TEST EXECUTION SHEET lists Operations Engineer signature and date. Operations Engineer not at Job.

INITIATOR NAME/ORGANIZATION: Rich Gutierrez / Retrieval OPS 12/10/99

QA – Ken Wilhoit 12/10/99

DATE OF EXCEPTION: 12-10-99

RESOLUTION OF EXCEPTION:

~~PCA AIP to remove Operations Engineer signature and date~~ RG 12/14/99
~~blocks. PCA will be written prior to Acceptance Test Report~~ RG 12/14/99

TEST DIRECTOR is also qualified as Operations Engineer and will sign both signature blocks.

CORRECTION APPROVAL:

TEST DIRECTOR INITIAL: RG. DATE: 12-14-99

DATE OF RESOLUTION:

TEST DIRECTOR SIGNATURE: R. Gutierrez	DATE: 12-14-99
TEST ENGINEER SIGNATURE: [signature]	DATE: 12-15-99
QUALITY ASSURANCE SIGNATURE: WL Adams	DATE: 12-14-99

ATP EXCEPTION RECORD

This page may be reproduced as necessary. Page _____ of _____

ATP Step Number: Local Interface Unit Enclosure 5.0	ATP Exception Log#: 02

Description of Exception: Unit has dual system, for purposes of ATP this test will consist of only testing one side of dual system. Within the body of this procedure we will take exceptions to all references/requirements to test both sides. We will redline this procedure to follow this approach and PCA this procedure prior to ATR issuance. This exception was written due to one side of the dual system (302B) not operable.

Initiator Name/Organization: R. Gutierrez 12/10/99/ Retrieval Ops.

QA - Ken Willing 12/10/99

Date of Exception: 12/10/99

Resolution of Exception: for this ATP we tested only one side, A2101-WST-CP-303 of the LOCAL INTERFACE UNIT ENCLOSURE, A2101-WST-ENCL-307. Discussed with procedure writer to rewrite procedure to adequately address testing of 302B at a later date, to be addressed as such.

Correction Approval:

Test Director Initial: Date:

Date of Resolution:

Test Director Signature: Rich Gutierrez	Date: 12-15-99
Test Engineer Signature: [signature]	Date: 12-15-99
Quality Assurance Signature: W L Adams	Date: 12-15-99

ATP EXCEPTION RECORD

This page may be reproduced as necessary. Page _____ of _____

ATP Step Number: Editorial changes	ATP Exception Log#: 03

Description of Exception: This Exception encompasses all editorial changes to this ATP. Steps include: 2.2.6, 5.1.14, 5.2.4, 5.2.3, 5.2.11, 5.5.1, 5.5.6, 5.5.7.

Initiator Name/Organization: R. Gutierrez 12/10/99 Test Director
K. Wallace 12/14/99 - QA

Date of Exception: 12/10/99

Resolution of Exception:

A PCA will be generated to correct all editorial changes prior to Acceptance Test Report.

Correction Approval:

Test Director Initial: Date:

Date of Resolution:

Test Director Signature: Rich Gutierrez	Date: 12-15-99
Test Engineer Signature: [illegible]	Date: 12-15-99
Quality Assurance Signature: WL Adams	Date: 12-14-99

ATP EXCEPTION RECORD

This page may be reproduced as necessary. Page _____ of _____

ATP Step Number: 5.2.6	ATP Exception Log#: 04

Description of Exception: Step states to obtain ~~1.25~~ 1.5 cfm or greater. a reading of 1.25 was obtained. RG 12/10/99

Initiator Name/Organization: R. Gutierrez 12/10/99/Retrieval OPS
K. [illegible] 12/10/99 — QA

Date of Exception: 12/10/99

Resolution of Exception: Timer in Purge control panel will be adjusted to allow 10 volume exchanges at 1.25 cfm.

Correction Approval:

Test Director Initial: Date:

Date of Resolution:

Test Director Signature: Rich Gutierrez	Date: 12-15-99
Test Engineer Signature: [illegible]	Date: 12-15-99
Quality Assurance Signature: WL Adams	Date: 12-15-99

ATP EXCEPTION RECORD

This page may be reproduced as necessary. Page _____ of _____

ATP Step Number: 5.3	ATP Exception Log#: 05

Description of Exception: ~~Ensure~~ RG 12/10/99 Adding steps to ensure Purge Air System is operating prior to camera operation.
5.1.2, 5.1.3, 5.1.4, 5.1.~~4~~ 6 RG 12/10/99, 5.1.7, 5.1.8, 5.1.9, 5.1.10, 5.1.11, 5.1.12.

Initiator Name/Organization: R. Gutierrez / Retrieval ops 12/10/99
K. Willing - QC 12/10/99
Date of Exception: 12/10/99

Resolution of Exception: PCA being generated to add steps to start Purge Air System.

Correction Approval:

Test Director Initial: Date:

Date of Resolution:

Test Director Signature: Rich Gutierrez	Date: 12-15-99
Test Engineer Signature: S.M. Wang	Date: 12-15-99
Quality Assurance Signature: WL Adams	Date: 12-14-99

ATP EXCEPTION RECORD

This page may be reproduced as necessary. Page _____ of _____

ATP Step Number: 5.4.8	ATP Exception Log#: 06

Description of Exception: camera was being tilted to the up position ~~and~~ 12/14 until the electronic stop position was reached. The camera was still tilting up when it was bumping into itself. Test Engineer manually stopped up tilt at 40 degrees.

Initiator Name/Organization: R. Gutierrez / Retrieval ops
K. Wilburg - QC 12-10-99

Date of Exception:

Resolution of Exception:

Tilt limit switches to be readjusted. Test Engineer will document adjusted reading in the ATR.

Correction Approval:

Test Director Initial: Date:

Date of Resolution:

Test Director Signature: Rich Gutierrez	Date: 12-15-99
Test Engineer Signature: [illegible]	Date: 12-15-99
Quality Assurance Signature: W L Adams	Date: 12-15-99

ATP EXCEPTION RECORD

This page may be reproduced as necessary. Page _____ of _____

ATP Step Number: 5.4.10	ATP Exception Log#: 07

Description of Exception: Step states to verify that the tilt has a range of 200 degrees minimum. our reading was at 199 due to manually stopping the upward tilt, unable to get a 200 degrees minimum.

Initiator Name/Organization: R. Gutierrez / Retrieval OPS

K. Wilting QC 12-10-99

Date of Exception: 12-10-99

Resolution of Exception:

PCA to be generated to change 200 degrees minimum to 180 degrees. Ref. Block 8 of EDT 628089 for final resolution. S.M. Wang for R. Gutierrez for Telson 12-21-99

Correction Approval:

Test Director Initial: Date:

Date of Resolution:

Test Director Signature: Rich Gutierrez	Date: 12-15-99
Test Engineer Signature: S.M. Wang	Date: 12-15-99
Quality Assurance Signature: W.L. Adams	Date: 12-15-99

ATP EXCEPTION RECORD

This page may be reproduced as necessary. Page _____ of _____

ATP Step Number: 5.5.3	ATP Exception Log#: 08
Description of Exception: deleting "Press the START/RESET" button AND" from this step. To continue with test. Air Purge system already running.	
Initiator Name/Organization: R. Gutierrez / Retrieval Ops K. Wilbourn QC 12-10-99 Date of Exception: 12/10/99	
Resolution of Exception: ~~PAC~~ RG 12/10/99 PCA to be written prior to Acceptance Test Report.	
Correction Approval:	
Test Director Initial: Date:	
Date of Resolution:	
Test Director Signature: Rich Gutierrez	Date: 12-15-99
Test Engineer Signature: S.M. Wang	Date: 12-15-99
Quality Assurance Signature: WL Adams	Date: 12-14-99

ATP EXCEPTION RECORD

This page may be reproduced as necessary. Page _____ of _____

ATP Step Number: ~~5.5.3~~ 5.5.4	ATP Exception Log#: 09

Description of Exception:

~~deleting~~ Press the ~~START/RESET~~ ~~butt~~ RG 12/14/99
deleting "After Purge cycle completes" to continue with test
Air purge system already running.

Initiator Name/Organization: R. Gutierrez / Retrieval ops
K. Wilbourg QC 12-10-99

Date of Exception: 12/10/99

Resolution of Exception:

PCA to be written prior to Acceptance Test Report.

Correction Approval:

Test Director Initial: Date:

Date of Resolution:

Test Director Signature: Rich Gutierrez	Date: 12-15-99
Test Engineer Signature: S.M. Weng	Date: 12-15-99
Quality Assurance Signature: W.L. Adams	Date: 12-14-99

WORKING COPY

Initialing for R. Gutierrez per telecon 1-20-00

ATP EXCEPTION RECORD

This page may be reproduced as necessary. Page _____ of ____

ATP Step Number: SPECIFIED TESTING TABLE	ATP Exception Log#: #10
Description of Exception: distance to background was changed for Test ~~Number S-006 from 47'10" to 41'2"~~ RG 12/10/99 ~~to 41'2"~~ RG 12/10/99 due to amount of space in shop. #S-002 from 49'4" to 41'2" due to shop space. #S-003 from 45'5" to 41'2" due to shop space. #S-007 from 44'7" to 41'2" due to shop space.	
Initiator Name/Organization: R. Gutierrez / Retrieval Ops K. Wilborg QC 12-10-99 Date of Exception: 12/10/99	
Resolution of Exception: PCA to be written ~~to~~ RG 12/10/99 prior to Acceptance Test Report.	
Correction Approval:	
Test Director Initial: Date:	
Date of Resolution:	
Test Director Signature: Rich Gutierrez	Date: 12-15-99
Test Engineer Signature: S.M. Wang	Date: 12-15-99
Quality Assurance Signature: WL Adams	Date: 12-14-99

SMWARRN PER TELECON 1-20-00
SMW FOR R. GUTIERREZ 2-08-99

29 of 31

PROCEDURE SIGNATURE SHEET

PRINT NAME	SIGNATURE	INITIALS
KEN WILLOUGHBY	K. Willoughby	KW
SCOTT A CAYLOR	S A Caylor	[illegible]
T. L. Clarke	T L Clarke	[illegible]
SM WERRY	SM Werry	[illegible]
GENE BIRDWELL	[illegible]	GB
ROGER HAMMER	R B HAMMER	RBH
JIM BELLOMY	J R Bellomy	JRB
Rich Gutierrez	R. Gutierrez	RG

PROCEDURE HISTORY SIGNATURE SHEET

7.0 ATTACHMENT 3 - ATP-260-002 REV. A-~~0~~ 1 SHOW 3-11-06, TEST PHASE 2

241-AZ WASTE TANK COLOR VIDEO CAMERA SYSTEM SHOP ACCEPTANCE TEST PROCEDURE

Last Full Revision: A-0

Release Date: 12/08/99

USQ Screening Number: N/A

Approval Designator: SQ

Current Modification: A-1

USQ Screening Number: TF-98-1201 Rev 1

Approval Designator: Q

PCA Incorporated: ETF-99-751

POSITION/ORG	DELEGATE	DATE
NCO/WTF	Vicki Miller	12/17/99
SOM	R. Gutierrez	12/17/99
QA/QC	W.L. Adams	12/17/99
Cog Eng/DST	W.M.Harty Jr.	12/16/99
Acceptance Review	David W. VanDyke	12/17/99
Approval Authority	Rich Guiterriez	12/17/99

Justification: Ops Request.

Summary of Changes:

In section 2.4 added in General Information. In section 5.0 various editorial changes through-out procedure. Section 5.2 changed Flow-Rate, Section 5.5 Added ENSURE and deleted part of steps as not neccessary. Specified Table Changed distance requirements.

1-10-2000

TESTED AZ101 WST-CP-303B, local Interface ENCLOSURE with AZ-156-WST-CP-302A, CAMERA CONTROL UNIT, AND PTE 600#1.

SMW 1-21-00

R. Gutierrez, TEST DIRECTOR OE/Retrieval Ops

1-18-2000

TESTED RCS-551 CAMERA WITH PTE 600#2 [illegible] for R. GUTIERREZ PER TELECO

TABLE OF CONTENTS PAGE

TEST EXECUTION SHEET 3

1.0 PURPOSE AND SCOPE 4
1.1 PURPOSE 4
1.2 SCOPE 4

2.0 INFORMATION 4
2.1 TERMS AND DEFINITIONS 4
2.2 RESPONSIBILITIES 4
2.3 REFERENCES 6
2.4 GENERAL INFORMATION 7
2.5 RECORDS 10

3.0 PRECAUTIONS AND LIMITATIONS 11
3.1 PERSONNEL SAFETY 11

4.0 PREREQUISITES 12
4.1 SPECIAL TOOLS, EQUIPMENT, AND SUPPLIES 12
4.2 CONDITIONS AND ACTIONS 13

5.0 PROCEDURE 14
5.1 START UP AND PURGE SYSTEM TEST 14
5.2 PURGE CONTROL SYSTEM AND DIFFERENTIAL PRESSURE SWITCH TEST . . 17
5.3 RCS-551 CAMERA UNIT 21
5.4 RCS-551 PAN AND TILT 23
5.5 DETECTION OF MOVEMENT TEST 25

SPECIFIED TESTING TABLE 27

DISCRETIONARY TESTING TABLE 28

FIGURE 1 29

FIGURE 2 30

ATP PERFORMANCE LOG 31

ATP EXCEPTION LOG 32

ATP EXCEPTION RECORD 33

PROCEDURE SIGNATURE SHEET 34

PROCEDURE HISTORY SIGNATURE SHEET 35

TEST EXECUTION SHEET

DATE:	DOCUMENT NUMBER: ATP-260-002
DOCUMENT TITLE: 241-AZ WASTE TANK COLOR VIDEO CAMERA SYSTEM SHOP ACCEPTANCE TEST PROCEDURE	
TEST PERSONNEL (PRINT NAMES)	
TEST DIRECTOR:	RECORDER:
OPERATIONS ENGINEER:	
TEST EXECUTION	
TEST DIRECTOR SIGNATURE/DATE:	TEST ENGINEER SIGNATURE/DATE:
OPERATIONS ENGINEER SIGNATURE/DATE:	RECORDER SIGNATURE/DATE:
APPROVAL AND ACCEPTANCE OF TEST RESULTS	
WITHOUT EXCEPTION _____ (✓)	WITH EXCEPTIONS RESOLVED _____ (✓) / WITH EXCEPTIONS REMAINING _____ (✓)
TEST DIRECTOR SIGNATURE/DATE:	PROJECT MANAGER SIGNATURE/DATE:
TEST ENGINEER SIGNATURE/DATE:	QUALITY ASSURANCE SIGNATURE/DATE:
DESIGN AUTHORITY SIGNATURE/DATE:	OPERATIONS ENGINEER SIGNATURE/DATE:
AUTHORIZED INSPECTOR SIGNATURE/DATE:	

1.0 PURPOSE AND SCOPE

1.1 PURPOSE

This procedure provides instructions to performing a Shop Acceptance Test Procedure for the 101 AZ camera system and camera purge gas (air) system.

1.2 SCOPE

This procedure shall demonstrate and document acceptance of the 241-AZ-101 Waste Tank Color Video Camera System, camera purge gas (air) system, and provides verification they function as designed.

The purge system functions will be tested verifying pressure and flow exists during camera system operation.

The purge control system functions will also be tested verifying automatic shutdown of in tank assemblies and electrical components is achieved upon loss of pressure. Functionality of differential pressure switches for operability and redundancy to show no single point failure exists in electrical shutdown system.

2.0 INFORMATION

2.1 TERMS AND DEFINITIONS

2.1.1 ALARA - As Low As Reasonably Achievable

2.2 RESPONSIBILITIES

2.2.1 Test Engineer is responsible for the following:

- All preparations for this Test have been completed
- Support Test Director and Test Personnel with the technical information and support necessary to complete this procedure

2.2.2 Operation Personnel are responsible for operating the camera systems per the Test Engineer and Test directors direction.

2.2 RESPONSIBILITIES (cont.)

2.2.3 Test Director is responsible for the following:

- Obtaining required signatures on the Test Procedure Working Copy prior to reproduction and distribution
- The safe, efficient, and productive performance of the test
- Coordination of all testing activities
- Signing the Acceptance Test Procedure Exception Record when a test exception has been resolved
- Preparing and issuing an Acceptance Test Report for the approved, accepted and completed Test Procedure
- Scheduling and conducting a pre-test meeting with test participants
- Notification of the persons performing and witnessing the test prior to the start of testing
- Notification of all involved test personnel when a change is made in the testing schedule
- Act as liaison between the participants involved with the testing
- Stopping any test or section which may cause damage to the system
- Approving field changes to the Test Procedure in accordance with Section 2.5.3
- Obtaining revisions to the Test Procedure, to comply with authorized field changes or to accommodate existing field conditions in accordance with Section 2.5.3
- Taking actions to resolve exceptions to the Test Procedure
- Evaluating recorded data, discrepancies, and exceptions
- Signing Test Execution Sheet when this Test Procedure has been performed
- Signing Exception Record when a retest to clear an exception has been executed and accepted

2.2 RESPONSIBILITIES (cont.)

2.2.4 QC Inspector is responsible for witnessing test execution and signing the completed sections of the test.

2.2.5 The Authorized Inspector is responsible for the following:

- Witnessing test execution
- Approval and signature of acceptance upon completion of this procedure.

2.3 REFERENCES

2.3.1 Acceptance Test Report 241-AZ-101 Waste Tank Color Video Camera System WHC-SD-WM-ATR-181 Rev 0

2.3.2 Purchase Specification WHC-S-0410, Rev 2 (P.O.# W-408171), "241-AZ-101, W151 Project, Suspended Fixture and Weld Inspection Camera System."

2.3.3 WHC-SD-W151-ETP-001, Rev. 1, "Engineering Task Plan for The 241-AZ-101 Waste Tank Color Video Camera System".

2.3.4 WHC-SD-WM-ATP-181, Rev. 0, "Acceptance Test Procedure 241-AZ-101 Waste Tank Color Video Camera System".

2.4 GENERAL INFORMATION

PROCEDURAL INFORMATION

2.4.1 All entries recorded in this procedure shall be made in black ink.

2.4.2 Procedural and technical requirement changes must be processed by Procedure Change Authorization in accordance with approved procedures. If a need for such a change is discovered in the course of running the test, the applicable portion of the test shall be stopped, and the test equipment shall be placed in a safe configuration, until the Procedure Change Authorization is approved. However, this does not prevent the running of another portion of the test unaffected by the change.

2.4.3 Acceptance Test steps detailed in individual Tests in Section 5.0 shall be performed sequentially, unless otherwise noted or as directed by the Test Director.

- Individual Test Procedure Sections may be performed out of sequence at the direction of the Test Director, if the intent of the test is not compromised
- As as each step is completed, each step will be checked off (or enter "N/A" for), as required in the spaces provided on the Working Copy of this Acceptance Test Procedure
- Any step that requires verification of data must include recording data on the Working Copy.

2.4.4 Any non-conformance of the instrumentation, unexpected results or exceptions during testing shall be sequentially numbered and recorded in the Acceptance Test Procedure Exception Log and on individual Acceptance Test Procedure Exception Records. Thus, case-by-case resolution, recording, approval, and distribution of each exception will be achieved.

2.4 GENERAL INFORMATION (Cont).

2.4.5 Resolve test exceptions in the following manner:

- Record the action taken to resolve each exception in the "Resolution of Exception" section of the Acceptance Test Procedure Exception Record.
- When the action taken results in an acceptable retest, initial and date the Correction Approval section of the Exception Sheet
- When the action taken does not result in an acceptable retest, provide a detailed explanation of why the retest action was not acceptable, and what additional plans are required. The Test Engineer then signs and dates the Resolution of Exception section of the Acceptance Test Procedure Exception Record, and obtains any other approvals required

2.4.6 Upon completion of the Acceptance Test Procedure, obtain approval of the test performance. Each Test Execution Sheet will stand alone as approval for the system under test. The Acceptance Test will be complete when all the outstanding tests have been performed and the Acceptance Test Report is prepared. The test will be approved by checking the proper response, with or without exceptions, on the Test Execution Sheet under the "Approval and Acceptance of Test Results" section of the Test Execution Sheet.

NOTE - The following steps detail the possible conditions that may exist at the completion of the Acceptance Test Procedure, and the steps necessary to complete acceptance in those conditions.

2.4 GENERAL INFORMATION (Cont).

2.4.7 The completed test may be approved without test exceptions:

- Check applicable space on Test Execution Sheet to show that the Acceptance Test Procedure has been performed and no exceptions have been recorded
- Appropriate individual Test Performers will sign and date the Test Execution Sheet in the spaces provided
- Distribute requisite copies as directed by the client
- Send the Master Copy of the completed Acceptance Test Procedure to the client.

2.4.8 The completed test may be approved with exceptions resolved:

- Check applicable space on Test Execution Sheet to show that this procedure has been performed with exceptions recorded and resolved
- Appropriate individual Test Performers will sign and date the Test Execution Sheet in the spaces provided
- Distribute requisite copies as directed by the client
- Send the Master Copy of the completed Acceptance Test Procedure to the client.

2.5 RECORDS

2.5.1 All personnel involved in the performance of this test shall sign in Procedure Signature Sheet.

2.5.2 Test results shall be recorded. All entries into this test procedure shall be made in black ink. Unless specific data is required, the signature or initials as applicable, 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. A complete working copy of this procedure and any exception records generated shall be maintained as a permanent record.

2.5.3 An Exception Log and Exception Record sheet is attached in the event exceptions to the test are made when the test is being performed. All exceptions to the test are to be dispositioned and agreed to by all witnesses. Actions taken regarding disposition are noted on the exception sheet. During the performance of this test, errors in test may be encountered which require correction or adjustment to complete the test. Such corrections are to be noted in the procedure and listed as an exception.

3.0 PRECAUTIONS AND LIMITATIONS

3.1 PERSONNEL SAFETY

3.1.1 If the performance of this procedure is suspended for any reason, ensure the equipment is left in a safe state.

3.1.2 All lockouts and tagouts or over-tagging requirements shall be performed in accordance with Tank Farm Administration Manual, HNF-IP-0842, Vol II, Section 4.9.1.

3.1.3 If any equipment problem is observed during the performance of this procedure, immediately notify the Test Director.

3.1.4 All fittings and safety devices such as whips and clamps pertaining to the compressed air system and associated hoses, SHALL be inspected prior to valving in the air.

3.1.5 Proper lifting techniques shall be utilized throughout the procedure and personnel shall take precautions to ensure back strain, pinchpoints and protective clothing are observed.

4.0 PREREQUISITES

4.1 SPECIAL TOOLS, EQUIPMENT, AND SUPPLIES

The following supplies may be needed to perform this procedure:

4.1.1 • Flowmeter (Per Test Engineer)

4.1.2 • Stopwatch

4.1.3 CAMERA ASSEMBLY SYSTEM

- Camera Mast
- Pan And Tilt Unit
- Overview Camera
- Two 75 watt halogen lights

4.1.4 FIELD UNITS

- Local Interface Unit
- Hazardous Location Control Panel
- Mobile Air Compressor

4.1.5 CAMERA CONTROLS

- Camera, Pan and Tilt, and Lighting Controls
- S Video Color Video Monitor
- Keyboard
- VCR and videotape
- Misc. optional video measurement and enhancement equipment.

4.1.6 TEST FIXTURES

- Lifting Adapters / Adapters
- Simulated In Tank Components

4.2 CONDITIONS AND ACTIONS

4.2.1 **ENSURE** all test personnel have been briefed on the hazards and responsibilities including a Job Hazard Analysis prior to performing this test.

Test Director Signature _____ Date _____

Test Director Print Name _____

4.2.2 **VERIFY** the camera, and camera purge (air) systems are completely assembled.

Test Director Signature _____ Date _____

Test Director Print Name _____

4.2.3 QC Witness sign below verifying that instrumentation listed below has been calibrated and a current calibration sticker is affixed.

- Flowmeter (0.5-4 cfm) OR acceptable substitute per Test Engineer.

ID Number: _____

Cal. Due Date: _____

QC Signature _____ Date _____

QC Priht Name _____

Previously tested on Rev A-0
Te

5.0 PROCEDURE

NOTE - Two control units need to be tested prior to installation in the field. Sections 1.0 - 5.5 may be copied, enabling test personnel to perform testing of additional control systems. All pertinent Record Sheets of this procedure may be copied as well, enabling capture of ID. numbers, test exception, resolution and other test data. All safety precautions and controls will be re-verified and re-signed for each set of camera system controls tested. Section 5.6 need only be tested on one control system.

NOTE - The total volume for the camera and mast assembly (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 Relays (TDRs) located in the Hazardous Location Power Controller are pre-set to a minimum of ~~10.2~~ 12.24 minutes at a minimum flow rate of ~~1.5~~ 1.25 cfm, (15.3 ft^3/~~1.5~~ 1.25 cfm = 12.24 ~~10.2~~ minutes) to allow for 15.3 ft^3 total flow. Adjustments to time delay relays may be necessary during the testing based on flow measurements obtained. (Ref. step 5.2.3)

5.1 START UP AND PURGE SYSTEM TEST

(1) 5.1.1 **ASSEMBLE** Camera system components per test directors direction.

___ 5.1.2 **TURN ON** purge air compressor system to a range of 15-25 psig, allowing purge air to flow through all paths.

___ 5.1.3 **CHECK** each suspect fitting or leak path for any significant leakage as determined by Test Engineer, in purge system, with "SNOOP" or other approved method as directed by Test Director.

___ 5.1.4 **REPAIR OR FIX** any leaks as necessary

(1) Previously Tested on Rev A-0

5.1 START UP AND PURGE SYSTEM TEST (Cont).

(1) ___ 5.1.5 **VERIFY** Purge path is acceptable for testing.

(1) _____ (1) _____
Test Director Signature Date

(1) _____
Test Director Print Name

___ 5.1.6 **ENSURE** ~~**POSITION**~~ the Hazardous Location Power Controller unit is in ~~to~~ the "ON" position **AND**

Begin **TIMING** purge system cycle.

___ 5.1.7 **ENSURE** the POWER indicating lamp is illuminated.

___ 5.1.8 **ENSURE** purge supply is allowing flow through Hazardous Location Power Controller.

___ 5.1.9 **ENSURE** the FLOW indicating lamp is illuminated.

___ 5.1.10 **ENSURE** the PRESSURE 1 indicating lamp is illuminated.

___ 5.1.11 **ENSURE** the PRESSURE 2 indicating lamp is illuminated.

___ 5.1.12 AFTER Purge cycle completes, **ENSURE** ENERGIZED indicator is illuminated **AND**

STOP timing purge system cycle.

___ 5.1.13 **RECORD** cycle time below.

(1) _____

(1) Previously tested on Rev A-0

5.1 START UP AND PURGE SYSTEM TEST (Cont).

(1) 5.1.14 Manually and momentarily **KINK** the purge supply hose to the camera cutting off flow.

5.1.15 **VERIFY** that system power down occurs after purge flow is interrupted, and ENERGIZED, PRESSURE 1 and PRESSURE 2 indicator lights located on the Hazardous Location Power Controller are no longer illuminated.

(1) _____ (1) _____
Test Director Signature Date

(1) _____
Test Director Print Name

5.1.16 **VERIFY** section 5.1 is complete.

(1) _____ (1) _____
Test Director Signature Date

(1) _____
Test Director Print Name

(1) _____ (1) _____
QC Signature Date

(1) _____
QC Print Name

(1) Previously tested on Rev A-0

5.2 PURGE CONTROL SYSTEM AND DIFFERENTIAL PRESSURE SWITCH TEST

(1) 5.2.1 **PLACE** a flowmeter (0.5 - 4.0 cfm range or acceptable equivalent) in-line with the purge air output side of the pressure relief valve, located on camera assembly light housing.

___ 5.2.2 **ENSURE** toggle switches on the differential pressure switch test box are in the ENABLE position.

___ 5.2.3 **PLACE** differential pressure switch test box inline with connector J4 (Ref Fig. 2) located on the rear of the Hazardous Location Power Controller and connector 36 or 39 as applicable, located on the bottom of the local interface unit.

___ 5.2.4 **ENSURE** ~~**TURN ON**~~ the purge air supply is "ON" **AND**

"IF neccessary" **PRESS** the START/RESET button located on the Hazardous Location Power Controller.

___ 5.2.5 **RECORD** the flowrate taken from the flowmeter.

Flow Rate __(1)__ cfm

___ 5.2.6 **VERIFY** flowrate is ~~1.5~~ 1.25 cfm or greater.

__(1)__ __(1)__
Test Director Signature Date

__(1)__
Test Director Print Name

___ 5.2.7 **TURN OFF** purge air supply.

___ 5.2.8 **REMOVE** flowmeter from system.

___ 5.2.9 **TURN ON** purge air supply **AND**

PRESS the START/RESET button located on the Hazardous Location Power Controller.

(1) Previously tested on Rev A-0

5.2 PURGE CONTROL SYSTEM AND DIFFERENTIAL PRESSURE SWITCH TEST (Cont).

(1) 5.2.10 **ENSURE** PURGING indicator is illuminated.

5.2.11 **ENSURE** ENERGIZED, PRESSURE 1, PRESSURE 2, and FLOW indicators are illuminated.

5.2.12 **ENSURE** ~~**POSITION**~~ PRESSURE 1 located on the test switch box, is in ~~to~~ the DISABLE position **AND**

VERIFY camera control and lighting system power is disabled.

(1) Test Director Signature (1) Date

(1) Test Director Print Name

5.2.13 **ENSURE** ~~**POSITION**~~ PRESSURE 1 is in ~~to~~ the "ENABLE" position.

5.2.14 **PRESS** the "START/RESET" button **AND**

ENSURE PURGING indicator is illuminated.

5.2.15 AFTER Purge cycle completes, **ENSURE** ENERGIZED, PRESSURE 1, PRESSURE 2, and flow indicators are illuminated.

5.2.16 **ENSURE** ~~**POSITION**~~ PRESSURE 2 located on the test switch box, is in ~~to~~ the "DISABLE" position **AND**

VERIFY camera control and lighting system power is disabled.

(1) Test Director Signature (1) Date

(1) Test Director Print Name

(1) Previously tested on Rev A-0

5.2 PURGE CONTROL SYSTEM AND DIFFERENTIAL PRESSURE SWITCH TEST (Cont).

(1) 5.2.17 **ATTEMPT** to reenergize system with PRESSURE 2 in the "DISABLED" position.

5.2.18 **VERIFY** Hazardous Location Power Controller will NOT allow camera control and lighting system to energize.

(1) Test Director Signature (1) Date

(1) Test Director Print Name

5.2.19 **ENSURE** ~~**POSITION**~~ PRESSURE 2 is in ~~to~~ the "ENABLE" position.

5.2.20 **ENSURE** ~~**POSITION**~~ PRESSURE 1 is in ~~to~~ the "DISABLE" position **AND**

VERIFY camera control and lighting system power is disabled.

(1) Test Director Signature (1) Date

(1) Test Director Print Name

(1) Previously tested on Rev A-0

5.2 PURGE CONTROL SYSTEM AND DIFFERENTIAL PRESSURE SWITCH TEST (Cont).

(1) 5.2.21 **ATTEMPT** to reenergize system with PRESSURE 1 in the "DISABLED" position.

5.2.22 **VERIFY** Hazardous Location Power Controller will NOT allow camera system to energize.

(1) Test Director Signature (1) Date

(1) Test Director Print Name

5.2.23 **REMOVE** Test Switch Box from system **AND**

RECONNECT J4 Cables.

5.2.24 **VERIFY** Section 5.2 is complete.

(1) Test Director Signature (1) Date

(1) Test Director Print Name

(1) QC Signature (1) Date

(1) QC Print Name

(1) Previously tested on Rev A-0

5.3 RCS-551 CAMERA UNIT

✓ 5.3.1 **RECORD** serial number of camera control unit.

Serial Number: 000625 (302A), LOCAL INTERFACE CP-303B

NOTE - During this portion of the test the Test Engineer shall verify each camera control is satisfactory and will then initial the space provided for each step.

✓ SMW 5.3.2 **PLUG** the video monitor and video recorder into the power source.

✓ SMW 5.3.3 **VERIFY** the video monitor and video recorder are operational.

✓ SMW 5.3.4 Using remote camera zoom control, manipulate the zoom control to wide angle.

✓ SMW 5.3.5 **VERIFY** the zoom moves towards wide when operated towards "wide".

✓ SMW 5.3.6 **MANIPULATE** the zoom control to telephoto.

✓ SMW 5.3.7 **VERIFY** the zoom moves towards telephoto when operated towards "telephoto".

✓ SMW 5.3.8 **MANIPULATE** the iris control to fully open.

✓ SMW 5.3.9 **VERIFY** the iris moves towards open when operated towards open.

✓ SMW 5.3.10 **MANIPULATE** the iris control to the fully closed position.

✓ SMW 5.3.11 **VERIFY** the iris moves towards the closed position when operated to the closed position.

✓ SMW 5.3.12 Using the near focus control, **VERIFY** that the focus adjusts to near when focused on an object that is "near".

✓ SMW 5.3.13 Using the far focus control, **VERIFY** that the focus adjusts to far when focused on an object that is "far".

5.3 RCS-551 CAMERA UNIT (Cont).

✓ 5.3.14 **START** Video Tape Recording.

✓ 5.3.15 While the camera is focused on an object, **VERIFY** that the picture is free of image defects such as ghost images, picture lag, distortion, hum, or smearing.

✓ 5.3.16 **PLAY BACK** the previously recorded taping of the resolution test.

✓ 5.3.17 **VERIFY** that the video recorder operates properly and that the image is acceptable.

5.3.18 **VERIFY** Section 5.3 is complete.

R Gutierrez — 1-10-2000
Test Director Signature — Date

Rich Gutierrez
Test Director Print Name

Paul A. Werner — 1-10-00
QC Signature — Date

Paul A Werner
QC Print Name

5.4 RCS-551 PAN AND TILT

NOTE - During this portion of the test the Test Engineer shall VERIFY each pan and tilt control is satisfactory and will then initial in the space provided for each step.

✓ SMW 5.4.1 Using the remote pan control, pan in the clockwise direction until stop is reached.

✓ SMW 5.4.2 **RECORD** the encoder readout for the position of the camera.

Encoder reading: 358 degrees

✓ SMW 5.4.3 **PAN** in the counterclockwise direction until stop is reached.

✓ SMW 5.4.4 **RECORD** the encoder readout.

Encoder reading: 0 degrees

✓ SMW 5.4.5 **VERIFY**, using the readings from step 5.4.1 - 5.4.4 that the panning operation has covered 358 degrees.

Overall reading: 358 degrees

✓ SMW 5.4.6 **TILT** the camera downward until the electronic stop position is reached.

✓ SMW 5.4.7 **RECORD** the encoder readout.

Encoder reading: 269 degrees

✓ SMW 5.4.8 **TILT** the camera up to the extreme upward position until the electronic stop position is reached.

✓ SMW 5.4.9 **RECORD** the encoder readout.

Encoder reading: 59 degrees

5.4 RCS-551 PAN AND TILT (Cont).

✓ SMW 5.4.10 **VERIFY** using the encoder readings from steps 5.4.6 - 5.4.9 that the tilt has a range of 200 degrees min.

Overall reading: 210 degrees

✓ SMW 5.4.11 **DE-ENERGIZE** the pan and tilt unit.

✓ SMW 5.4.12 **VERIFY** that the pan and tilt maintains it's position.

✓ SMW 5.4.13 **VERIFY** Section 5.4 is complete.

R. Gutierrez — 1-18-2000
Test Director Signature — Date

Rich Gutierrez
Test Director Print Name

Paul A. Werner — 1-18-00
QC Signature — Date

Paul A. Werner
QC Print Name

5.5 DETECTION OF MOVEMENT TEST

NOTE - Two types of tests will be performed and data will ~~shall~~ be recorded on either the Specified Testing Table OR the Discretionary Testing Table. The objective in this test section is to determine the minimum detectable movement, at various distances, with the camera system. Adjustments such as lighting changes, camera adjustments etc. may be done at anytime during this section as directed by Test Director.

(1) 5.5.1 **ENSURE** ~~**POSITION**~~ the Hazardous Location Power Controller unit is in ~~to~~ the "ON" position **AND**

ENSURE POWER indicator is illuminated.

5.5.2 **ENSURE** purge supply is allowing flow through Hazardous Location Power Controller.

5.5.3 ~~**PRESS the "START/RESET" button AND**~~ **ENSURE** PURGING indicator is illuminated.

5.5.4 ~~AFTER Purge cycle completes,~~ **ENSURE** ENERGIZED indicator is illuminated.

5.5.5 **RECORD** Test Date, and Camera system ID. number on applicable Testing Table.

5.5.6 **PLACE** a simulated dark background, carbon steel plate or other similar background as approved by Test director, a measured distance from the camera, **AND**

RECORD distance on applicable Test Table.

5.5.7 **PLACE** a simulated in-tank assembly BETWEEN the camera and the simulated background **AND**

RECORD component size, and distance on applicable Test Table.

5.5.8 **ELIMINATE** All non-camera light sources as completely as possible, **AND**

RECORD any light sources still present on the Performance Log.

5.5.9 **FOCUS** camera on simulated assembly.

(1) Previously tested on Rev A-0

5.5 DETECTION OF MOVEMENT TEST (Cont).

(1) 5.5.10 **MOVE** simulated assembly in 1/32" increments, until camera operator detects movement.

___ 5.5.11 **RECORD** the distance moved on applicable Test Table.

___ 5.5.12 **RECORD** any special camera adjustments, lighting changes, or any comments on applicable Test Table.

___ 5.5.13 **REPEAT** steps 5.5.7 - 5.5.12 as directed by Test Director to determine minimum movement detectable.

___ 5.5.14 **VERIFY** Section 5.5 is complete.

(1) Test Director Signature (1) Date

(1) Test Director Print Name

(1) QC Signature (1) Date

(1) QC Print Name

(1) Previously Tested on Rev A-0

CAMERA SYSTEM ID NUMBER (1)

DATE (1)

AZ-101 CAMERA COMPONENT DISPLACEMENT / RESOLUTION TESTING SPECIFIED TESTING TABLE

Test Number	Date/Time	Distance To		Component Diameter	Minimum Distance Detected	Lighting Configuration	Comments
		Background	Component				
S-001		39' 10"	12' 8"	6 5/8"			ALC-2
S-002		~~49' 4"~~ 41' 2"	26' 0"	6 5/8"			ALC-5
S-003		~~45' 5"~~ 41' 2"	20' 6"	6 5/8"			ALC-6
S-004		31' 0"	19' 8"	6 5/8"	(1)		ALC-10
S-005		36' 9"	25' 4"	6 5/8"			ALC-11
S-006		~~47' 10"~~ 41' 2"	37' 2"	6 5/8"			ALC-17
S-007		~~44' 7"~~ 41' 2"	33' 7"	6 5/8"			ALC-18
S-008		26' 5"	23' 7"	2 3/8"			T/C-15E
S-009		30' 1"	27' 3"	2 3/8"			T/C-15F
		50' 0"	5' 0"				
		50' 0"	10' 0"				
		50' 0"	20' 0"				
		50' 0"	30' 0"				
		50' 0"	40' 0"				

(1) Previously tested on Rev A-0

CAMERA SYSTEM ID NUMBER ①

DATE ①

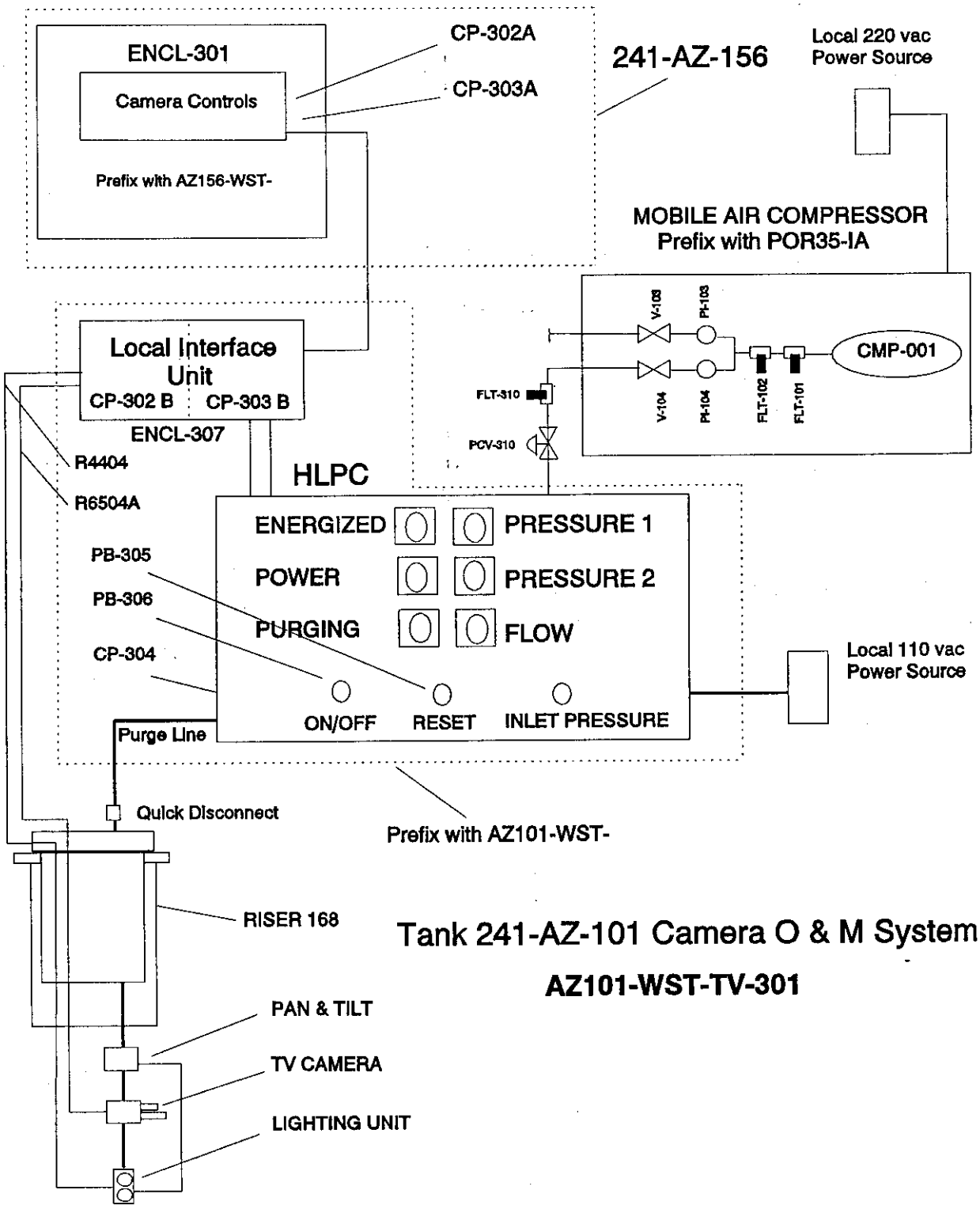
AZ-101 CAMERA COMPONENT DISPLACEMENT / RESOLUTION TESTING DISCRETIONARY TESTING TABLE

Test Number	Date/Time	Distance To		Component Diameter	Minimum Distance Detected	Lighting Configuration	Comments
		Background	Component				
D-							
D-							
D-							
D-						①	
D-							
D-							
D-							
D-							
D-							

① Previously tested on Rev A-0

RPP-5640 REV. 0

FIGURE 1

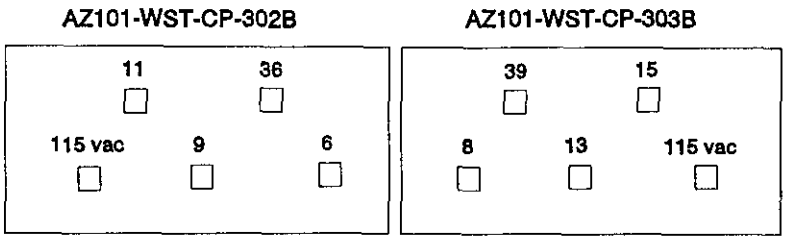


Tank 241-AZ-101 Camera O & M System

AZ101-WST-TV-301

FIGURE 2

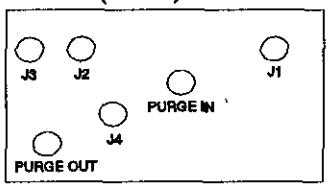
LOCAL INTERFACE UNIT ENCLOSURE
AZ101-WST-ENCL-307



#11 Mate to 302 B Mast Jnct. Box (TV-301)
#36 Mate to 302 B Gas Monitoring (CP-304)
#9 Mate to 302 B Mast Jnct. Box (TV-301)
#6 Mate to CP-302 A (Ref. Fig. 1)
115 vac to Gas Monitoring System

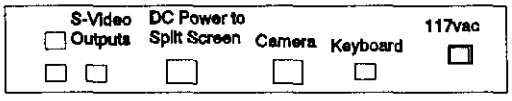
#15 Mate to 303 B Mast Jnct. Box (TV-301)
#39 Mate to 303 B Gas Monitoring (CP-304)
#13 Mate to 303 B Mast Jnct. Box (TV-301)
#8 Mate to CP-303 A (Ref. Fig. 1)
115 vac to Gas Monitoring System

HAZARDOUS LOCATION POWER CONTROLLER (HLPC)

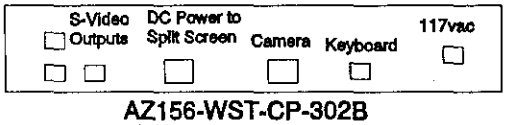


AZ101-WST-CP-304

AZ156-WST-ENCL-301
CAMERA CONTROL UNIT REAR PANEL

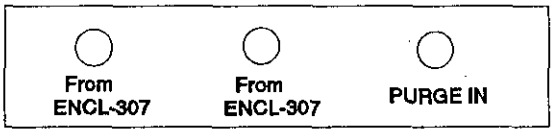


AZ156-WST-CP-302A



AZ156-WST-CP-302B

UPPER CAMERA AZ101-WST-TV-301



ATP PERFORMANCE LOG

This page may be reproduced as necessary. Page 1 of ____

ATP PERFORMANCE EVENT	DATE	INITIALS
This copy used to test Local Interface	1-10-2000	RG
UNIT 303-B with camera control 302A.		
Completed 5.3 section, started 5.4 section		
started Pan counterclockwise rotation, the		
monitor image jumped and when the image		
came back Test Engineer noticed the		
pan/tilt reading was at 356, should of		
been 180. Possible cause, suspect water		
in the connections. Test was stopped and		
will resume after corrections to equipment		
are made.	1/10/2000	RG
Crane Crew lifted camera upright.	1/18/2000	RG
System was set up with purge & lights.		
System local Interface Enclosure		
AZ 101-WST-CP-302B hooked up to		
Camera control 000625.		
AZ 101 WST-CP-303B is being taken		
out, due to equipment problems.		
Section 5.4 tested with no exceptions		

ATP EXCEPTION LOG

This page may be reproduced as necessary. Page _____ of _____

Number	Date	Description

ATP EXCEPTION RECORD

This page may be reproduced as necessary. Page _____ of _____

ATP STEP NUMBER:	ATP EXCEPTION LOG#:
DESCRIPTION OF EXCEPTION:	
INITIATOR NAME/ORGANIZATION:	
DATE OF EXCEPTION:	
RESOLUTION OF EXCEPTION:	
CORRECTION APPROVAL:	
TEST DIRECTOR INITIAL: DATE:	
DATE OF RESOLUTION:	
TEST DIRECTOR SIGNATURE:	DATE:
TEST ENGINEER SIGNATURE:	DATE:
QUALITY ASSURANCE SIGNATURE:	DATE:

PROCEDURE SIGNATURE SHEET

PRINT NAME	SIGNATURE	INITIALS
CHARLES W PEAKE	Charles W Peake	CWP
Rich Gutierrez	R. Gutierrez	RG
Paul A. Werner (QC)	Paul A. Werner	PAW
SCOTT M. WERNY	Scott M. Werny	SMW
ROD J BREWER	R J Brewer	RJB
S A Caylor	S A Caylor	SAC

PROCEDURE HISTORY SIGNATURE SHEET

Last Full Revision: A-0
Release Date: 12/08/99
USQ Screening Number: N/A
Approval Designator: SQ

Current Modification: A-0
USQ Screening Number: N/A
Approval Designator: SQ
PCA Incorporated: N/A

POSITION/ORG	DELEGATE	DATE
NCO/WTF	Vicki Miller	12/7/99
SOM	R. Gutierrez	12/8/99
QA/QC	W.L. Adams	12/8/99
SAFTEY	Ernie Hurst	12/8/99
TWRS Rad Con	Bob Brown	12/8/99
Enviornmental	T.A. Dilhoff	12/8/99
Cog Eng/DST	Gary Tardiff	12/7/99
Cog Equip. Eng.	R. Robinson	12/8/99
Acceptance Review	David W. VanDyke	12/8/99
Approval Authority	James Bryce	12/8/99

Justification: New Procedure.

Summary of Changes:
N/A

8.0 ATTACHMENT 4 - ATP-260-002 REV. A-1, TEST PHASE 3

241-AZ WASTE TANK COLOR VIDEO CAMERA SYSTEM SHOP ACCEPTANCE TEST PROCEDURE

Last Full Revision: A-0
Release Date: 12/08/99
USQ Screening Number: N/A
Approval Designator: SQ

Current Modification: A-1
USQ Screening Number: TF-98-1201 Rev 1
Approval Designator: Q
PCA Incorporated: ETF-99-751

POSITION/ORG	DELEGATE	DATE
NCO/WTF	Vicki Miller	12/17/99
SOM	R. Gutierrez	12/17/99
QA/QC	W.L. Adams	12/17/99
Cog Eng/DST	W.M.Harty Jr.	12/16/99
Acceptance Review	David W. VanDyke	12/17/99
Approval Authority	Rich Guiterrjez	12/17/99

Justification: Ops Request.

Summary of Changes:
In section 2.4 added in General Information. In section 5.0 various editorial changes through-out procedure. Section 5.2 changed Flow-Rate, Section 5.5 Added ENSURE and deleted part of steps as not neccessary. Specified Table Changed distance requirements.

1-10-2000
Tested AZ101 WST-CP-302B, LOCAL INTERFACE ENCLOSURES
with AZ156-WST-CP-302A, CAMERA CONTROL UNIT,
AND PTE LOG #1.
SIGN FOR R. GUTIERREZ 1-20-00 PER TELECON

R. Gatewing, Test DIRECTOR
OE/Retrieval ops

TABLE OF CONTENTS PAGE

TEST EXECUTION SHEET 3

1.0 PURPOSE AND SCOPE 4
1.1 PURPOSE 4
1.2 SCOPE 4

2.0 INFORMATION 4
2.1 TERMS AND DEFINITIONS 4
2.2 RESPONSIBILITIES 4
2.3 REFERENCES 6
2.4 GENERAL INFORMATION 7
2.5 RECORDS 10

3.0 PRECAUTIONS AND LIMITATIONS 11
3.1 PERSONNEL SAFETY 11

4.0 PREREQUISITES 12
4.1 SPECIAL TOOLS, EQUIPMENT, AND SUPPLIES 12
4.2 CONDITIONS AND ACTIONS 13

5.0 PROCEDURE 14
5.1 START UP AND PURGE SYSTEM TEST 14
5.2 PURGE CONTROL SYSTEM AND DIFFERENTIAL PRESSURE SWITCH TEST . . 17
5.3 RCS-551 CAMERA UNIT 21
5.4 RCS-551 PAN AND TILT 23
5.5 DETECTION OF MOVEMENT TEST 25

SPECIFIED TESTING TABLE 27

DISCRETIONARY TESTING TABLE 28

FIGURE 1 29

FIGURE 2 30

ATP PERFORMANCE LOG 31

ATP EXCEPTION LOG 32

ATP EXCEPTION RECORD 33

PROCEDURE SIGNATURE SHEET 34

PROCEDURE HISTORY SIGNATURE SHEET 35

TEST EXECUTION SHEET

DATE:	DOCUMENT NUMBER: ATP-260-002
DOCUMENT TITLE: 241-AZ WASTE TANK COLOR VIDEO CAMERA SYSTEM SHOP ACCEPTANCE TEST PROCEDURE	
TEST PERSONNEL (PRINT NAMES)	
TEST DIRECTOR:	RECORDER:
OPERATIONS ENGINEER:	
TEST EXECUTION	
TEST DIRECTOR SIGNATURE/DATE:	TEST ENGINEER SIGNATURE/DATE:
OPERATIONS ENGINEER SIGNATURE/DATE:	RECORDER SIGNATURE/DATE:
APPROVAL AND ACCEPTANCE OF TEST RESULTS	
WITHOUT EXCEPTION _____ (✓)	WITH EXCEPTIONS RESOLVED _____ (✓) WITH EXCEPTIONS REMAINING _____ (✓)
TEST DIRECTOR SIGNATURE/DATE:	PROJECT MANAGER SIGNATURE/DATE:
TEST ENGINEER SIGNATURE/DATE:	QUALITY ASSURANCE SIGNATURE/DATE:
DESIGN AUTHORITY SIGNATURE/DATE:	OPERATIONS ENGINEER SIGNATURE/DATE:
AUTHORIZED INSPECTOR SIGNATURE/DATE:	

1.0 PURPOSE AND SCOPE

1.1 PURPOSE

This procedure provides instructions to performing a Shop Acceptance Test Procedure for the 101 AZ camera system and camera purge gas (air) system.

1.2 SCOPE

This procedure shall demonstrate and document acceptance of the 241-AZ-101 Waste Tank Color Video Camera System, camera purge gas (air) system, and provides verification they function as designed.

The purge system functions will be tested verifying pressure and flow exists during camera system operation.

The purge control system functions will also be tested verifying automatic shutdown of in tank assemblies and electrical components is achieved upon loss of pressure. Functionality of differential pressure switches for operability and redundancy to show no single point failure exists in electrical shutdown system.

2.0 INFORMATION

2.1 TERMS AND DEFINITIONS

2.1.1 ALARA - As Low As Reasonably Achievable

2.2 RESPONSIBILITIES

2.2.1 Test Engineer is responsible for the following:

- All preparations for this Test have been completed
- Support Test Director and Test Personnel with the technical information and support necessary to complete this procedure

2.2.2 Operation Personnel are responsible for operating the camera systems per the Test Engineer and Test directors direction.

2.2 RESPONSIBILITIES (cont.)

2.2.3 Test Director is responsible for the following:

- Obtaining required signatures on the Test Procedure Working Copy prior to reproduction and distribution
- The safe, efficient, and productive performance of the test
- Coordination of all testing activities
- Signing the Acceptance Test Procedure Exception Record when a test exception has been resolved
- Preparing and issuing an Acceptance Test Report for the approved, accepted and completed Test Procedure
- Scheduling and conducting a pre-test meeting with test participants
- Notification of the persons performing and witnessing the test prior to the start of testing
- Notification of all involved test personnel when a change is made in the testing schedule
- Act as liaison between the participants involved with the testing
- Stopping any test or section which may cause damage to the system
- Approving field changes to the Test Procedure in accordance with Section 2.5.3
- Obtaining revisions to the Test Procedure, to comply with authorized field changes or to accommodate existing field conditions in accordance with Section 2.5.3
- Taking actions to resolve exceptions to the Test Procedure
- Evaluating recorded data, discrepancies, and exceptions
- Signing Test Execution Sheet when this Test Procedure has been performed
- Signing Exception Record when a retest to clear an exception has been executed and accepted

2.2 RESPONSIBILITIES (cont.)

2.2.4 QC Inspector is responsible for witnessing test execution and signing the completed sections of the test.

2.2.5 The Authorized Inspector is responsible for the following:

- Witnessing test execution
- Approval and signature of acceptance upon completion of this procedure.

2.3 REFERENCES

2.3.1 Acceptance Test Report 241-AZ-101 Waste Tank Color Video Camera System WHC-SD-WM-ATR-181 Rev 0

2.3.2 Purchase Specification WHC-S-0410, Rev 2 (P.O.# W-408171), "241-AZ-101, W151 Project, Suspended Fixture and Weld Inspection Camera System."

2.3.3 WHC-SD-W151-ETP-001, Rev. 1, "Engineering Task Plan for The 241-AZ-101 Waste Tank Color Video Camera System".

2.3.4 WHC-SD-WM-ATP-181, Rev. 0, "Acceptance Test Procedure 241-AZ-101 Waste Tank Color Video Camera System".

2.4 GENERAL INFORMATION

PROCEDURAL INFORMATION

2.4.1 All entries recorded in this procedure shall be made in black ink.

2.4.2 Procedural and technical requirement changes must be processed by Procedure Change Authorization in accordance with approved procedures. If a need for such a change is discovered in the course of running the test, the applicable portion of the test shall be stopped, and the test equipment shall be placed in a safe configuration, until the Procedure Change Authorization is approved. However, this does not prevent the running of another portion of the test unaffected by the change.

2.4.3 Acceptance Test steps detailed in individual Tests in Section 5.0 shall be performed sequentially, unless otherwise noted or as directed by the Test Director.

- Individual Test Procedure Sections may be performed out of sequence at the direction of the Test Director, if the intent of the test is not compromised

- As as each step is completed, each step will be checked off (or enter "N/A" for), as required in the spaces provided on the Working Copy of this Acceptance Test Procedure

- Any step that requires verification of data must include recording data on the Working Copy.

2.4.4 Any non-conformance of the instrumentation, unexpected results or exceptions during testing shall be sequentially numbered and recorded in the Acceptance Test Procedure Exception Log and on individual Acceptance Test Procedure Exception Records. Thus, case-by-case resolution, recording, approval, and distribution of each exception will be achieved.

2.4 GENERAL INFORMATION (Cont).

2.4.5 Resolve test exceptions in the following manner:

- Record the action taken to resolve each exception in the "Resolution of Exception" section of the Acceptance Test Procedure Exception Record.
- When the action taken results in an acceptable retest, initial and date the Correction Approval section of the Exception Sheet
- When the action taken does not result in an acceptable retest, provide a detailed explanation of why the retest action was not acceptable, and what additional plans are required. The Test Engineer then signs and dates the Resolution of Exception section of the Acceptance Test Procedure Exception Record, and obtains any other approvals required

2.4.6 Upon completion of the Acceptance Test Procedure, obtain approval of the test performance. Each Test Execution Sheet will stand alone as approval for the system under test. The Acceptance Test will be complete when all the outstanding tests have been performed and the Acceptance Test Report is prepared. The test will be approved by checking the proper response, with or without exceptions, on the Test Execution Sheet under the "Approval and Acceptance of Test Results" section of the Test Execution Sheet.

NOTE - The following steps detail the possible conditions that may exist at the completion of the Acceptance Test Procedure, and the steps necessary to complete acceptance in those conditions.

2.4 GENERAL INFORMATION (Cont).

2.4.7 The completed test may be approved without test exceptions:

- Check applicable space on Test Execution Sheet to show that the Acceptance Test Procedure has been performed and no exceptions have been recorded
- Appropriate individual Test Performers will sign and date the Test Execution Sheet in the spaces provided
- Distribute requisite copies as directed by the client
- Send the Master Copy of the completed Acceptance Test Procedure to the client.

2.4.8 The completed test may be approved with exceptions resolved:

- Check applicable space on Test Execution Sheet to show that this procedure has been performed with exceptions recorded and resolved
- Appropriate individual Test Performers will sign and date the Test Execution Sheet in the spaces provided
- Distribute requisite copies as directed by the client
- Send the Master Copy of the completed Acceptance Test Procedure to the client.

2.5 RECORDS

2.5.1 All personnel involved in the performance of this test shall sign in Procedure Signature Sheet.

2.5.2 Test results shall be recorded. All entries into this test procedure shall be made in black ink. Unless specific data is required, the signature or initials as applicable, 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. A complete working copy of this procedure and any exception records generated shall be maintained as a permanent record.

2.5.3 An Exception Log and Exception Record sheet is attached in the event exceptions to the test are made when the test is being performed. All exceptions to the test are to be dispositioned and agreed to by all witnesses. Actions taken regarding disposition are noted on the exception sheet. During the performance of this test, errors in test may be encountered which require correction or adjustment to complete the test. Such corrections are to be noted in the procedure and listed as an exception.

3.0 PRECAUTIONS AND LIMITATIONS

3.1 PERSONNEL SAFETY

3.1.1 If the performance of this procedure is suspended for any reason, ensure the equipment is left in a safe state.

3.1.2 All lockouts and tagouts or over-tagging requirements shall be performed in accordance with Tank Farm Administration Manual, HNF-IP-0842, Vol II, Section 4.9.1.

3.1.3 If any equipment problem is observed during the performance of this procedure, immediately notify the Test Director.

3.1.4 All fittings and safety devices such as whips and clamps pertaining to the compressed air system and associated hoses, SHALL be inspected prior to valving in the air.

3.1.5 Proper lifting techniques shall be utilized throughout the procedure and personnel shall take precautions to ensure back strain, pinchpoints and protective clothing are observed.

4.0 PREREQUISITES

4.1 SPECIAL TOOLS, EQUIPMENT, AND SUPPLIES

The following supplies may be needed to perform this procedure:

4.1.1 • Flowmeter (Per Test Engineer)

4.1.2 • Stopwatch

4.1.3 CAMERA ASSEMBLY SYSTEM

- Camera Mast
- Pan And Tilt Unit
- Overview Camera
- Two 75 watt halogen lights

4.1.4 FIELD UNITS

- Local Interface Unit
- Hazardous Location Control Panel
- Mobile Air Compressor

4.1.5 CAMERA CONTROLS

- Camera, Pan and Tilt, and Lighting Controls
- S Video Color Video Monitor
- Keyboard
- VCR and videotape
- Misc. optional video measurement and enhancement equipment.

4.1.6 TEST FIXTURES

- Lifting Adapters / Adapters
- Simulated In Tank Components

4.2 CONDITIONS AND ACTIONS

4.2.1 **ENSURE** all test personnel have been briefed on the hazards and responsibilities including a Job Hazard Analysis prior to performing this test.

R. Gutierrez 01/10/2000
Test Director Signature Date

R. Gutierrez
Test Director Print Name

4.2.2 **VERIFY** the camera, and camera purge (air) systems are completely assembled.

R. Gutierrez 01/10/2000
Test Director Signature Date

R. Gutierrez
Test Director Print Name

4.2.3 QC Witness sign below verifying that instrumentation listed below has been calibrated and a current calibration sticker is affixed.

- Flowmeter (0.5-4 cfm) OR acceptable substitute per Test Engineer.

ID Number: (1)

Cal. Due Date: (1)

(1) (1)
QC Signature Date

(1)
QC Print Name

(1) previously tested + signed on original copy Rev A-0.

5.0 PROCEDURE

NOTE - Two control units need to be tested prior to installation in the field. Sections 1.0 - 5.5 may be copied, enabling test personnel to perform testing of additional control systems. All pertinent Record Sheets of this procedure may be copied as well, enabling capture of ID. numbers, test exception, resolution and other test data. All safety precautions and controls will be re-verified and re-signed for each set of camera system controls tested. Section 5.6 need only be tested on one control system.

NOTE - The total volume for the camera and mast assembly (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 Relays (TDRs) located in the Hazardous Location Power Controller are pre-set to a minimum of ~~10.2~~ 12.24 minutes at a minimum flow rate of ~~1.5~~ 1.25 cfm, (15.3 ft^3/~~1.5~~ 1.25 cfm = 12.24 ~~10.2~~ minutes) to allow for 15.3 ft^3 total flow. Adjustments to time delay relays may be necessary during the testing based on flow measurements obtained. (Ref. step 5.2.3)

5.1 START UP AND PURGE SYSTEM TEST

0 ✓ 5.1.1 **ASSEMBLE** Camera system components per test directors direction.

22 psig 0 ✓ 5.1.2 **TURN ON** purge air compressor system to a range of 15-25 psig, allowing purge air to flow through all paths.

0 ✓ 5.1.3 **CHECK** each suspect fitting or leak path for any significant leakage as determined by Test Engineer, in purge system, with "SNOOP" or other approved method as directed by Test Director.

0 ✓ 5.1.4 **REPAIR OR FIX** any leaks as necessary

Previously tested and recorded on Rev A-0.

5.1 START UP AND PURGE SYSTEM TEST (Cont).

(1) ✓ ____ 5.1.5 **VERIFY** Purge path is acceptable for testing.

R. Gutierrez — 1/10/2000
Test Director Signature — Date

R. Gutierrez
Test Director Print Name

✓ ____ 5.1.6 **ENSURE** ~~**POSITION**~~ the Hazardous Location Power Controller unit is in ~~to~~ the "ON" position **AND**

Begin **TIMING** purge system cycle.

____ 5.1.7 **ENSURE** the POWER indicating lamp is illuminated.

____ 5.1.8 **ENSURE** purge supply is allowing flow through Hazardous Location Power Controller.

____ 5.1.9 **ENSURE** the FLOW indicating lamp is illuminated.

____ 5.1.10 **ENSURE** the PRESSURE 1 indicating lamp is illuminated.

____ 5.1.11 **ENSURE** the PRESSURE 2 indicating lamp is illuminated.

____ 5.1.12 AFTER Purge cycle completes, **ENSURE** ENERGIZED indicator is illuminated **AND**

STOP timing purge system cycle.

____ 5.1.13 **RECORD** cycle time below.

_____

(1) Previously Tested on Rev A-0

5.1 START UP AND PURGE SYSTEM TEST (Cont).

1 5.1.14 Manually and momentarily **KINK** the purge supply hose to the camera cutting off flow.

5.1.15 **VERIFY** that system power down occurs after purge flow is interrupted, and ENERGIZED, PRESSURE 1 and PRESSURE 2 indicator lights located on the Hazardous Location Power Controller are no longer illuminated.

1 1

Test Director Signature Date

1

Test Director Print Name

5.1.16 **VERIFY** section 5.1 is complete.

1 1

Test Director Signature Date

1

Test Director Print Name

1 1

QC Signature Date

1

QC Print Name

1 P Reviously tested in Rev A-0

5.2 PURGE CONTROL SYSTEM AND DIFFERENTIAL PRESSURE SWITCH TEST

____ 5.2.1 **PLACE** a flowmeter (0.5 - 4.0 cfm range or acceptable equivalent) in-line with the purge air output side of the pressure relief valve, located on camera assembly light housing.

____ 5.2.2 **ENSURE** toggle switches on the differential pressure switch test box are in the ENABLE position.

____ 5.2.3 **PLACE** differential pressure switch test box inline with connector J4 (Ref Fig. 2) located on the rear of the Hazardous Location Power Controller and connector 36 or 39 as applicable, located on the bottom of the local interface unit.

____ 5.2.4 **ENSURE** ~~**TURN ON**~~ the purge air supply is "ON" **AND**

"IF neccessary" **PRESS** the START/RESET button located on the Hazardous Location Power Controller.

____ 5.2.5 **RECORD** the flowrate taken from the flowmeter.

Flow Rate ____ cfm

____ 5.2.6 **VERIFY** flowrate is ~~1.5~~ 1.25 cfm or greater.

____ ____
Test Director Signature Date

____
Test Director Print Name

____ 5.2.7 **TURN OFF** purge air supply.

____ 5.2.8 **REMOVE** flowmeter from system.

____ 5.2.9 **TURN ON** purge air supply **AND**

PRESS the START/RESET button located on the Hazardous Location Power Controller.

Previously tested in Rev A-0

5.2 PURGE CONTROL SYSTEM AND DIFFERENTIAL PRESSURE SWITCH TEST (Cont).

1 ___ 5.2.10 **ENSURE** PURGING indicator is illuminated.

___ 5.2.11 **ENSURE** ENERGIZED, PRESSURE 1, PRESSURE 2, and FLOW indicators are illuminated.

___ 5.2.12 **ENSURE** ~~**POSITION**~~ PRESSURE 1 located on the test switch box, is in ~~to~~ the DISABLE position **AND**

VERIFY camera control and lighting system power is disabled.

1 _____ 1 _____
Test Director Signature Date

1 _____
Test Director Print Name

___ 5.2.13 **ENSURE** ~~**POSITION**~~ PRESSURE 1 is in ~~to~~ the "ENABLE" position.

___ 5.2.14 **PRESS** the "START/RESET" button **AND**

ENSURE PURGING indicator is illuminated.

___ 5.2.15 AFTER Purge cycle completes, **ENSURE** ENERGIZED, PRESSURE 1, PRESSURE 2, and flow indicators are illuminated.

___ 5.2.16 **ENSURE** ~~**POSITION**~~ PRESSURE 2 located on the test switch box, is in ~~to~~ the "DISABLE" position **AND**

VERIFY camera control and lighting system power is disabled.

1 _____ 1 _____
Test Director Signature Date

1 _____
Test Director Print Name

1 Previously tested in Rev A0

5.2 PURGE CONTROL SYSTEM AND DIFFERENTIAL PRESSURE SWITCH TEST (Cont).

(1) ___ 5.2.17 **ATTEMPT** to reenergize system with PRESSURE 2 in the "DISABLED" position.

___ 5.2.18 **VERIFY** Hazardous Location Power Controller will NOT allow camera control and lighting system to energize.

(1) _____ (1) _____
Test Director Signature Date

(1) _____
Test Director Print Name

___ 5.2.19 **ENSURE** ~~**POSITION**~~ PRESSURE 2 is in ~~to~~ the "ENABLE" position.

___ 5.2.20 **ENSURE** ~~**POSITION**~~ PRESSURE 1 is in ~~to~~ the "DISABLE" position **AND**

VERIFY camera control and lighting system power is disabled.

(1) _____ (1) _____
Test Director Signature Date

(1) _____
Test Director Print Name

(1). Previously Tested in Rev A-0

5.2 PURGE CONTROL SYSTEM AND DIFFERENTIAL PRESSURE SWITCH TEST (Cont).

(1) 5.2.21 **ATTEMPT** to reenergize system with PRESSURE 1 in the "DISABLED" position.

____ 5.2.22 **VERIFY** Hazardous Location Power Controller will NOT allow camera system to energize.

(1) Test Director Signature (1) Date

(1) Test Director Print Name

____ 5.2.23 **REMOVE** Test Switch Box from system **AND**

RECONNECT J4 Cables.

____ 5.2.24 **VERIFY** Section 5.2 is complete.

(1) Test Director Signature (1) Date

(1) Test Director Print Name

(1) QC Signature (1) Date

(1) QC Print Name

(1) Previously tested in Rev A-0

5.3 RCS-551 CAMERA UNIT

(1) 5.3.1 **RECORD** serial number of camera control unit.

Serial Number: (1) _____

NOTE - During this portion of the test the Test Engineer shall verify each camera control is satisfactory and will then initial the space provided for each step.

___ 5.3.2 **PLUG** the video monitor and video recorder into the power source.

___ 5.3.3 **VERIFY** the video monitor and video recorder are operational.

___ 5.3.4 Using remote camera zoom control, manipulate the zoom control to wide angle.

___ 5.3.5 **VERIFY** the zoom moves towards wide when operated towards "wide".

___ 5.3.6 **MANIPULATE** the zoom control to telephoto.

___ 5.3.7 **VERIFY** the zoom moves towards telephoto when operated towards "telephoto".

___ 5.3.8 **MANIPULATE** the iris control to fully open.

___ 5.3.9 **VERIFY** the iris moves towards open when operated towards open.

___ 5.3.10 **MANIPULATE** the iris control to the fully closed position.

___ 5.3.11 **VERIFY** the iris moves towards the closed position when operated to the closed position.

___ 5.3.12 Using the near focus control, **VERIFY** that the focus adjusts to near when focused on an object that is "near".

___ 5.3.13 Using the far focus control, **VERIFY** that the focus adjusts to far when focused on an object that is "far".

(1) Previously Tested on Rev A-0.

5.3 RCS-551 CAMERA UNIT (Cont).

(1) 5.3.14 **START** Video Tape Recording.

5.3.15 While the camera is focused on an object, **VERIFY** that the picture is free of image defects such as ghost images, picture lag, distortion, hum, or smearing.

5.3.16 **PLAY BACK** the previously recorded taping of the resolution test.

5.3.17 **VERIFY** that the video recorder operates properly and that the image is acceptable.

5.3.18 **VERIFY** Section 5.3 is complete.

(1) _____ (1) _____
Test Director Signature Date

(1) _____
Test Director Print Name

(1) _____ (1) _____
QC Signature Date

(1) _____
QC Print Name

(1) previously tested and signed on Rev A-0.

5.4 RCS-551 PAN AND TILT

NOTE - During this portion of the test the Test Engineer shall VERIFY each pan and tilt control is satisfactory and will then initial in the space provided for each step.

(1) 5.4.1 Using the remote pan control, pan in the clockwise direction until stop is reached.

5.4.2 **RECORD** the encoder readout for the position of the camera.

Encoder reading: (1) degrees

5.4.3 **PAN** in the counterclockwise direction until stop is reached.

5.4.4 **RECORD** the encoder readout.

Encoder reading: (1) degrees

5.4.5 **VERIFY**, using the readings from step 5.4.1 - 5.4.4 that the panning operation has covered 358 degrees.

Overall reading: (1) degrees

5.4.6 **TILT** the camera downward until the electronic stop position is reached.

5.4.7 **RECORD** the encoder readout.

Encoder reading: (1) degrees

5.4.8 **TILT** the camera up to the extreme upward position until the electronic stop position is reached.

5.4.9 **RECORD** the encoder readout.

Encoder reading: (1) degrees

(1) Previously Tested and ~~Recording~~ recorded in Rev A-0.

5.4 RCS-551 PAN AND TILT (Cont).

RG 5.4.10 **VERIFY** using the encoder readings from steps 5.4.6 - 5.4.9 that the tilt has a range of 200 degrees min.

Overall reading: 211 degrees

(1) 5.4.11 **DE-ENERGIZE** the pan and tilt unit.

(1) 5.4.12 **VERIFY** that the pan and tilt maintains it's position.

(1) 5.4.13 **VERIFY** Section 5.4 is complete.

(1) Test Director Signature (1) Date

(1) Test Director Print Name

(1) QC Signature (1) Date

(1) QC Print Name

(1) previously tested and signed on Rev A-0.

5.5 DETECTION OF MOVEMENT TEST

NOTE - Two types of tests will be performed and data will ~~shall~~ be recorded on either the Specified Testing Table OR the Discretionary Testing Table. The objective in this test section is to determine the minimum detectable movement, at various distances, with the camera system. Adjustments such as lighting changes, camera adjustments etc. may be done at anytime during this section as directed by Test Director.

1 ___ 5.5.1 **ENSURE** ~~**POSITION**~~ the Hazardous Location Power Controller unit is in ~~to~~ the "ON" position **AND**

ENSURE POWER indicator is illuminated.

___ 5.5.2 **ENSURE** purge supply is allowing flow through Hazardous Location Power Controller.

___ 5.5.3 ~~**PRESS** the "START/RESET" button **AND**~~ **ENSURE** PURGING indicator is illuminated.

___ 5.5.4 ~~AFTER Purge cycle completes,~~ **ENSURE** ENERGIZED indicator is illuminated.

___ 5.5.5 **RECORD** Test Date, and Camera system ID. number on applicable Testing Table.

___ 5.5.6 **PLACE** a simulated dark background, carbon steel plate or other similar background as approved by Test director, a measured distance from the camera, **AND**

RECORD distance on applicable Test Table.

___ 5.5.7 **PLACE** a simulated in-tank assembly BETWEEN the camera and the simulated background **AND**

RECORD component size, and distance on applicable Test Table.

___ 5.5.8 **ELIMINATE** All non-camera light sources as completely as possible, **AND**

RECORD any light sources still present on the Performance Log.

___ 5.5.9 **FOCUS** camera on simulated assembly.

Previously tested on Rev A-0

5.5 DETECTION OF MOVEMENT TEST (Cont).

___	5.5.10	**MOVE** simulated assembly in 1/32" increments, until camera operator detects movement.
___	5.5.11	**RECORD** the distance moved on applicable Test Table.
___	5.5.12	**RECORD** any special camera adjustments, lighting changes, or any comments on applicable Test Table.
___	5.5.13	**REPEAT** steps 5.5.7 - 5.5.12 as directed by Test Director to determine minimum movement detectable.
___	5.5.14	**VERIFY** Section 5.5 is complete.

_____ Test Director Signature	_____ Date
_____ Test Director Print Name	
_____ QC Signature	_____ Date
_____ QC Print Name	

Previously tested and recorded on Rev A-0.

CAMERA SYSTEM ID NUMBER 0

DATE 0

AZ-101 CAMERA COMPONENT DISPLACEMENT / RESOLUTION TESTING SPECIFIED TESTING TABLE

Test Number	Date/Time	Distance To		Component Diameter	Minimum Distance Detected	Lighting Configuration	Comments
		Background	Component				
S-001		39' 10"	12' 8"	6 5/8"			ALC-2
S-002		~~49' 4"~~ 41' 2"	26' 0"	6 5/8"			ALC-5
S-003		~~45' 5"~~ 41' 2"	20' 6"	6 5/8"			ALC-6
S-004		31' 0"	19' 8"	6 5/8"			ALC-10
S-005		36' 9"	25' 4"	6 5/8"	1		ALC-11
S-006		~~47' 10"~~ 41' 2"	37' 2"	6 5/8"			ALC-17
S-007		~~44' 7"~~ 41' 2"	33' 7"	6 5/8"			ALC-18
S-008		26' 5"	23' 7"	2 3/8"			T/C-15E
S-009		30' 1"	27' 3"	2 3/8"			T/C-15F
		50' 0"	5' 0"				
		50' 0"	10' 0"				
		50' 0"	20' 0"				
		50' 0"	30' 0"				
		50' 0"	40' 0"				

1 Previously tested on Rev A-0

118

RPP-5640 REV. 0

CAMERA SYSTEM ID NUMBER ___0___

DATE ___0___

AZ-101 CAMERA COMPONENT DISPLACEMENT / RESOLUTION TESTING
DISCRETIONARY TESTING TABLE

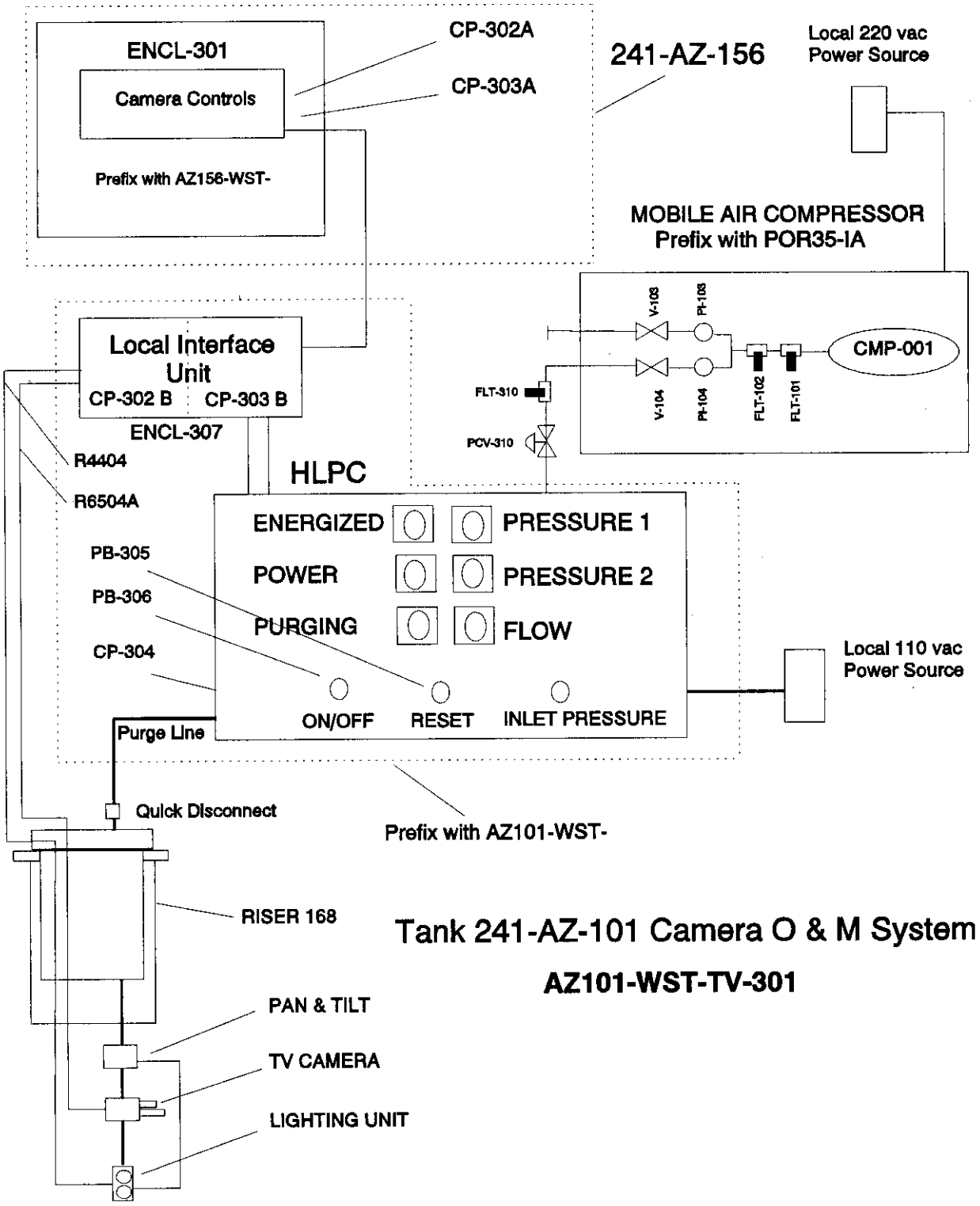
Test Number	Date/Time	Distance To		Component Diameter	Minimum Distance Detected	Lighting Configuration	Comments
		Background	Component				
D-							
D-							
D-							
D-							
D-					0		
D-							
D-							
D-							
D-							

0 Previously tested on Rev A-0

119

RPP-5640 REV. 0

FIGURE 1



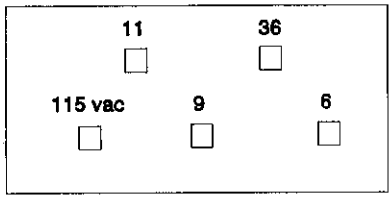
Tank 241-AZ-101 Camera O & M System

AZ101-WST-TV-301

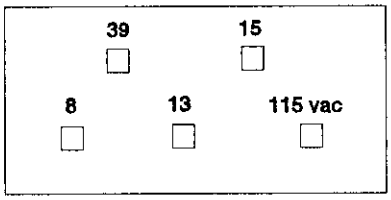
FIGURE 2

LOCAL INTERFACE UNIT ENCLOSURE
AZ101-WST-ENCL-307

AZ101-WST-CP-302B



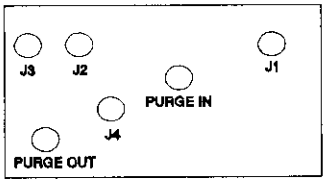
AZ101-WST-CP-303B



#11 Mate to 302 B Mast Jnct. Box (TV-301)
#36 Mate to 302 B Gas Monitoring (CP-304)
#9 Mate to 302 B Mast Jnct. Box (TV-301)
#6 Mate to CP-302 A (Ref. Fig. 1)
115 vac to Gas Monitoring System

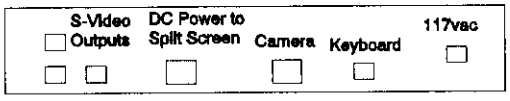
#15 Mate to 303 B Mast Jnct. Box (TV-301)
#39 Mate to 303 B Gas Monitoring (CP-304)
#13 Mate to 303 B Mast Jnct. Box (TV-301)
#8 Mate to CP-303 A (Ref. Fig. 1)
115 vac to Gas Monitoring System

HAZARDOUS LOCATION POWER CONTROLLER
(HLPC)

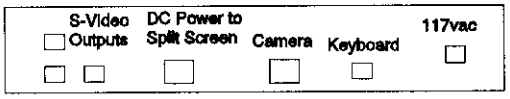


AZ101-WST-CP-304

AZ156-WST-ENCL-301
CAMERA CONTROL UNIT REAR PANEL

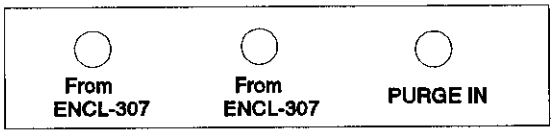


AZ156-WST-CP-302A



AZ156-WST-CP-302B
303 A

UPPER CAMERA AZ101-WST-TV-301



ATP PERFORMANCE LOG

This page may be reproduced as necessary. Page 1 of ____

ATP PERFORMANCE EVENT	DATE	INITIALS
Step 5.1.1 Set up 302B Control Unit	1/10/2000	RG
to 302A Camera control Unit		
Performed step 5.4.10 obtained a range		
of 211 degrees.		
270 - 59		
(down) (up)		
Step 5.4.6 was 270 degrees and		
step 5.4.9 was 59 degrees	1/10/2000	RG

ATP EXCEPTION LOG

This page may be reproduced as necessary. Page _____ of _____

Number	Date	Description

ATP EXCEPTION RECORD

This page may be reproduced as necessary. Page _____ of _____

ATP STEP NUMBER:	ATP EXCEPTION LOG#:
DESCRIPTION OF EXCEPTION:	
INITIATOR NAME/ORGANIZATION:	
DATE OF EXCEPTION:	
RESOLUTION OF EXCEPTION:	
CORRECTION APPROVAL:	
TEST DIRECTOR INITIAL: DATE:	
DATE OF RESOLUTION:	
TEST DIRECTOR SIGNATURE:	DATE:
TEST ENGINEER SIGNATURE:	DATE:
QUALITY ASSURANCE SIGNATURE:	DATE:

PROCEDURE SIGNATURE SHEET

PRINT NAME	SIGNATURE	INITIALS
Scott Weitzey	[illegible]	SW
Paul A. Werner (OC)	[illegible]	PAW
Tom Clarke	[illegible]	TC
Rich Gutierrez	R. Gutierrez	RG
Steve Stamper	[illegible]	SS
Jeff Dunn	[illegible]	[illegible]

PROCEDURE HISTORY SIGNATURE SHEET

Last Full Revision: A-0
Release Date: 12/08/99
USQ Screening Number: N/A
Approval Designator: SQ

Current Modification: A-0
USQ Screening Number: N/A
Approval Designator: SQ
PCA Incorporated: N/A

POSITION/ORG	DELEGATE	DATE
NCO/WTF	Vicki Miller	12/7/99
SOM	R. Gutierrez	12/8/99
QA/QC	W.L. Adams	12/8/99
SAFTEY	Ernie Hurst	12/8/99
TWRS Rad Con	Bob Brown	12/8/99
Enviornmental	T.A. Dilhoff	12/8/99
Cog Eng/DST	Gary Tardiff	12/7/99
Cog Equip. Eng.	R. Robinson	12/8/99
Acceptance Review	David W. VanDyke	12/8/99
Approval Authority	James Bryce	12/8/99

Justification: New Procedure.

Summary of Changes:
N/A

9.0 ATTACHMENT 5 - MACRO SCALE MEASUREMENTS USING CCTV MICROMETER MEMORANDUM

9.0 Attachment 5

MEMORANDUM

TO: Alan Carlson CC: Jim Homan, Dave Smet
FROM: Scott Werry, Dennis Douglas
SUBJECT: Macro Scale Measurements Using CCTV Micrometer

In mid-December 1999, a series of shop tests were performed on the CCTV and Colorado Video system. These tests served two purposes. First, they all owed the CCTV system to be functionally checked prior to installing it in AZ-101. Second, they allowed to optical performance of the system to be assessed in terms of resolution, contrast, illumination, and so on.

An analysis of the imaged data, based upon the operator logs recorded during the tests, was performed immediately after the tests. This analysis focussed on the fine-scale resolving capabilities of the CCTV measurement system. The results of the analysis showed that the CCTV/micrometer system is expected to be able to reliably measure the displacements of objects in AZ-101 as small as 1/8", or so[1].

At the other extreme, a test was performed where a ruler was placed in the CCTV field of view at a distance of about 33-feet from the camera. The "0" of the ruler was placed at the right-hand edge of a 6.63" inch cylinder in the field of view. The test consisted of moving the micrometer cursor (previously set to the right-edge reading of 6.63") along the image of the ruler and recording the micrometer reading after placing the cursor over the inch markings on the imaged ruler. The results of this test are illustrated below.

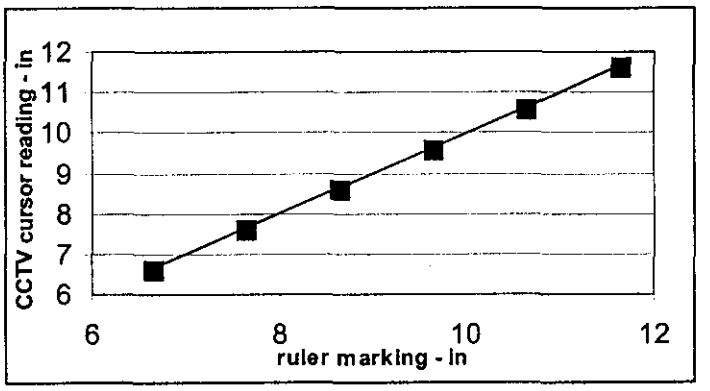


Figure 1. CCTV shop testing: actual versus measured macro-scale displacement

The displacements of objects on AZ-101 as a result of the jet forces are expected to range from a fraction of an inch to several inches. Based upon the micro-scale measurement capability of the CCTV reported earlier, and the macro-scale results reported here, it is concluded that, to the extent that the scene conditions in AZ-101 are similar to those in the shop test, that the CCTV system will adequately measure the displacements of objects in AZ-101 that are caused by the jet forces, to the accuracy that is required and described in the data analysis plan[2].

Approved Jim Werry 1-27-00

[1] Memo from D. Douglas to Alan Carlson, December 16, 1999.
[2] D. Douglas, HNF-3840 Rev 0

DISTRIBUTION SHEET

To	From	Page 1 of 1
Distribution	Maintenance & Reliability Eng.	Date 02/01/2000
Project Title/Work Order: 241-AZ-101 Waste Tank Color Video Camera System Shop Acceptance Test Report		EDT No. ~~628089~~ 628095
		ECN No.

Name	MSIN	Text With All Attach.	Text Only	Attach./ Appendix Only	EDT/ECN Only
WL Adams	S6-16	x			
JR Bellomy	R1-56	x			
TL Clarke	N1-29	x			
RV Gutierrez	R5-03	x			
RS Robinson	R1-56	x			
DH Shuford	R1-56	x			
DB Smet	R1-56	x			
GR Tardiff	S5-05	x			
PA Werner	S5-15	x			
SM Werry	R1-56	x			
RJ Fogg	S5-12	X			
JK Andersen	H1-19	x			