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JAN 2 7 2000

ENGINEERING DATA TRANSMITTAL

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5 Proj./Prog./Dept./Div W-151/RPP	6 Design Authority/Design Agent/Cog Engr G R Tardiff	7 Purchase Order No N/A
8 Originator Remarks For approval and release		9 Equip /Component No N/A
		10 System/Bldg./Facility N/A
		12 Major Assm Dwg No N/A
11 Receiver Remarks	11A Design Baseline Document? (●) Yes ( ) No	13 Permit/Permit Application No N/A
		14 Required Response Date N/A

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-5681	-	0	Acceptance Test Report	SQ	1	1	1

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 G Tardiff	[signature]	01/26/00	S5-05	1	1	J E Andrews	[signature]	1/25/00	S5-04
1	1	Design Agent N/A				1	1	J Bellomy	[signature]	1/26/00	R1-56
1	1	Cog Eng D Bragg	[signature]	01/25/00	S5-05	1	1	D Stenkamp	[signature]	1/26/00	R3 88
1	1	Cog Mgr D Reberger for De Bride	[signature]	1/26/00	S5-13						
1	1	QA C Sams	[signature]	1/26/00	S6 15						
1	1	Safety R Fogg	[signature]	1/26/00	S5-12						
		Env N/A									

18	19	20	21 DOE APPROVAL (if required)
[signature] 1/25/00 J E Andrews Signature of EDT Originator Date	N/A Authorized Representative for Receiving Organization Date	[signature] G Tardiff 1/26/00 Design Authority/ Cognizant Manager Date	Ctrl No N/A ( ) Approved ( ) Approved w/comments ( ) Disapproved w/comments

BD-7400-172 2 (10/97)

BD 7400-172 1

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Acceptance Test Report For The 241-AZ-101 Ultrasonic Interface Level Analyzer

JE Andrews, CHG

Richland, WA 99352
U S Department of Energy Contract DE-AC06-96RL13200

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Key Words Acceptance test report, Project W-151, RPP-5681, Ultrasonic Interface Level Analyzer

Abstract. This document comprises the Acceptance Test Report for the 241-AZ-101 Ultrasonic Interface Level Analyzer

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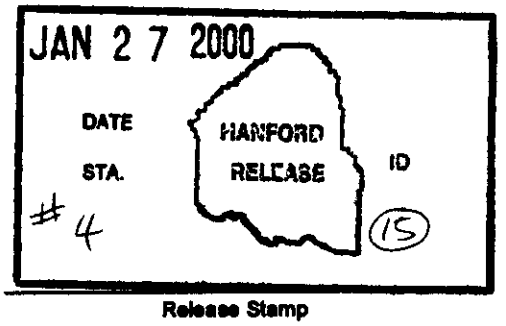

Release Approval 1/26/00 Date

Release Stamp

Approved For Public Release

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Acceptance Test Report
For The
Ultrasonic Interface Level Analyzer

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COMPLETED COPY OF ATP-260-001
FOR ANALYZER WST-LY-703 A1-1

ATTACHMENT 2

COMPLETED COPY OF ATP-260-001
FOR ANALYZER WST-LY-704 A2-1

ATTACHMENT 3

COMPLETED COPY OF ATP-260-001
FOR ANALYZER WST-LY-705 A3-1

1 0 INTRODUCTION

This document presents the results of Acceptance Testing of the 241-AZ-101 Ultrasonic Interface Level Analyzers (URSILLAs) Testing of the URSILLAs was performed in accordance with ATP-260-001, "URSILLA Pre-installation Acceptance Test Procedure" The objective of the testing was to verify that all equipment and components function in accordance with design specifications and original equipment manufacturer's specifications

2 0 TEST DESCRIPTION

Testing of the URSILLAs was completed over the course of approximately 3 weeks as tank farm conditions, equipment availability, and operations resources allowed Test procedure ATP-260-001 required two revisions prior to testing to incorporate Procedure Change Authorizations (PCAs) necessary to facilitate testing Specific equipment tested by ATP-260-001 included the following components

- Ultrasonic Interface Level Analyzers WST-LY-703
  WST-LY-704
  WST-LY-705
- URSILLA personal computer and software
- Three URSILLA probes

3 0 TEST RESULTS

All testing of the 241-AZ-101 Ultrasonic Interface Level Analyzer system was completed satisfactorily There were no test exceptions identified during testing Completed copies of all test procedures are found in Attachments 1, 2, and 3

4 0 CONCLUSIONS

The test procedure is acceptable as written and performed As a result of the testing performed under ATP-260-001, it can be concluded that the URSILLA system is ready for Operational testing

ATTACHMENT 1

COMPLETED COPY OF ATP-260-001 FOR ANALYZER WST-LY-703

WST-LY-703
(Riser 5D)

URSILLA PRE-INSTALLATION ACCEPTANCE TEST PROCEDURE

Last Full Revision	A-0
Release Date	11/22/99
USQ Screening Number	TF-99-0899 REV 0
Approval Designator	SQ

Current Modification	A-2
USQ Screening Number	TF-98-1201 REV 1
Approval Designator	Q
PCA Incorporated	ETF-99-751

POSITION/ORG	DELEGATE	DATE
LNCO/OPS	Vicki Miller	12/17/99
QA Eng	W.L Adams	12/17/99
Shift Manager	J E Andrews	12/17/99
Cog Eng	W M. Harty Jr	12/17/99
Acceptance Review	David W.VanDyke	12/17/99
Approval Authority	J.E. Andrews	12/17/99

Justification Ops Request

Summary of Changes Word Changes on Steps 5 2 10, 5 2 11, 5 2 14, 5 2 16 and 5 2 20

The NEXT DUE DATE - 12/17/2001 -

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ACCEPTANCE TEST PROCEDURE PERFORMANCE LOG 23

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PROCEDURE SIGNATURE SHEET 26

PROCEDURE HISTORY SIGNATURE SHEET 27

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TEST EXECUTION SHEET

DATE 1/4/00	DOCUMENT NUMBER:
DOCUMENT TITLE: URSILLA PRE-INSTALLATION ACCEPTANCE TEST PROCEDURE	
TEST PERSONNEL (PRINT NAMES)	
TEST DIRECTOR JE Andrews	AUTHORIZED INSPECTOR Clarke Tom Walker 1/4/00
TEST ENGINEER: Dan Stenkamp Dan Stenkamp	RECORDER JE Andrews
TEST EXECUTION	
TEST DIRECTOR SIGNATURE/DATE JE Andrews 1/4/00	TEST ENGINEER SIGNATURE/DATE Dan Stenkamp 01/04/00
	RECORDER SIGNATURE/DATE JE Andrews 1/4/00
APPROVAL AND ACCEPTANCE OF TEST RESULTS	
WITHOUT EXCEPTION ✓ (✓) / WITH EXCEPTIONS RESOLVED ____ (✓) / WITH EXCEPTIONS REMAINING ____ (✓)	
TEST DIRECTOR SIGNATURE/DATE JE Andrews 1/4/00	PROJECT MANAGER SIGNATURE/DATE 1-11-00
TEST ENGINEER SIGNATURE/DATE Dan Stenkamp 1/4/00	QUALITY ASSURANCE SIGNATURE/DATE WK Adams 1/10/00
AUTHORIZED INSPECTOR SIGNATURE/DATE GR Clarke 1/4/00	DESIGN AUTHORITY SIGNATURE/DATE 1-5-00

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1.0 PURPOSE AND SCOPE

1 1 PURPOSE

The purpose of this procedure is to test the ability of the Ultrasonic Interface Level Analyzer (URSILLA), Instrument Assemblies to perform data collection functions per design specifications

1 2 SCOPE

This Pre Operational Acceptance Test Procedure will test the functional components, and the ability to collect data with a STAND-ALONE software system

2 0 INFORMATION

2 1 TERMS AND DEFINITIONS

2 1 1 Tank Depth- Distance between sensor and test container wall

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2 2 RESPONSIBILITIES

2 2 1 Each company or organization participating in the conduct of this procedure will designate personnel to assume the responsibilities and duties as defined herein for their respective roles The names of these designees shall be provided to the Recorder for listing on the Working Copy of the Test Execution Sheet prior to the performance of any part of this procedure

2 2 2 The Lockheed Martin Hanford Corporation Project Manager is responsible for the following

- Designation of a test director
- Signing the Test Execution Sheet when the Acceptance Test Procedure is approved and accepted as complete
- Signing for operations where applicable in this procedure
- Performing a Post-Test Review of Acceptance Test documentation

2 2 3 The Test Director is responsible for the following

- Signing for operations where applicable in this procedure
- Performing a Post-Test Review of Acceptance Test documentation
- Setting the safe boundaries for performing this procedure
- Coordination of all acceptance testing
- Signing the Acceptance Test Procedure Exception Record when a test exception has been resolved
- Preparing and issuing an Acceptance Test Report for the approved and accepted Acceptance Test Procedure when testing is completed
- Scheduling and conducting a pre-test meeting with acceptance test participants prior to start of testing

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2 2 RESPONSIBILITIES (Cont)

- Notification of the persons performing and witnessing the test prior to the start of testing
- Notification of all concerned parties when a change is made in the testing schedule
- Acting as liaison between the participants in acceptance testing
- Stopping any test which may cause damage to the system until the Acceptance Test Procedure has been revised
- Approving field changes to the Acceptance Test Procedure in accordance with Section 2 5
- Obtaining revisions to the Acceptance Test Procedure, as necessary, to comply with authorized field changes or to accommodate existing field conditions in accordance with Section 2 5
- Taking necessary actions to clear exceptions to the Acceptance Test Procedure
- Evaluating recorded data, discrepancies, and exceptions

2 2 4 The Recorder is responsible for the following

- Performing all recording duties using black ink
- Recording the names of all designated personnel on the Working Copy of this procedure prior to start of testing
- Observing tests, recording test data, and maintaining the Acceptance Test Procedure Performance Log
- Signing the Test Execution Sheet as the Recorder
- Ensuring every test verification step requiring signature on the Working Copy of this Acceptance Test Procedure is successfully performed, to indicate that Acceptance Criterion has been met
- Recording authorized field changes to this Acceptance Test Procedure

2 2 RESPONSIBILITIES (Cont)

- Recording Test Exceptions and individual Test Procedure steps that are not performed satisfactorily on the Acceptance Test Procedure Exception Record and ensuring that the information is transferred (in ink or typed) to the master Working Copy of Acceptance Test Procedure Exception Record(s) Additional Acceptance Test Procedure Exception Records are to be added as needed

- Notifying the Test Director at the time any objection is made during performance of the Acceptance Test Procedure

- Submitting the completed master Working Copy of this Acceptance Test Procedure to the Test Director for approval signatures and distribution

2 2 5 The Test Engineer is responsible for the following

- Ensuring all equipment required for performing this Acceptance Test Procedure listed in Section 4 1 will be available at the start of testing

- Obtaining any information or changes necessary to clear or resolve objections

- Providing technical input to test personnel as needed relating to the configuration of equipment and systems to be tested and utilized in this procedure

- Post Review of Acceptance Test Documentation

2 2 6 The Quality Assurance Representative is responsible for the following

- Review and approval of test exception resolutions

- Performing a Post-Test Review of Acceptance Test documentation

- Review and approval of test results

2 2 7 QC Inspector is responsible for witnessing test execution and signing the completed sections of the test

2 2 8 The Authorized Inspector is responsible for the following

- Witnessing test execution

- Approval and signature of acceptance upon completion of this procedure

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2 3 RECORDS

2 3 1 The completed master "Working Copy" of this Acceptance Test Procedure, Acceptance test report,the completed "Test Execution Sheet", the completed "Acceptance Test Procedure Performance Log" and "Acceptance Test Procedure Exception Log", and all "Test Exception Sheets" generated during performance of this Acceptance Test Procedure will be kept as permanent records

2 4 REFERENCES

2 4 1 The following documents were used to write or are referenced in this procedure

- ROYCE instrument Corporation, *Model 2511, Interface Level Analyzer Operators Manual*, New Orleans, La , VIN 0022515, Supplement 041
- ROYCE instrument Corporation, *Model 2511, Interface Level Analyzer Profile Program Instructions*, New Orleans, La VIN 0022515, Supplement 041
- Witwer, K S , 1995a, *Status on Royce Interface Level Detector*, Internal Memo to G T Maclean, May 3, 1995
- Witwer, K S , 1995b, *Current Status and Results of Royce Ultrasonic Sensor Testing*, Memo to G T Maclean, September 19, 1995
- Witwer, K S , 1999, *Report on Testing of the Royce Interface Level Analyzer*, HNF-3782, Rev 0, February 25, 1999, Numatec Hanford Company, Richland , Washington

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2 5 GENERAL INFORMATION

VENDOR INFORMATION

The Royce Instrument Corporation Model 2511 Interface Level Analyzer (URSILLA) system uses an ultrasonic ranging technique (SONAR) to measure sludge depths in holding tanks Three Ultrasonic Interface Level Analyzer instrument assemblies provided by the W-151 project are planned to be used during mixer pump testing to provide data for determining sludge mobilization effectiveness of the mixer pumps and sludge settling rates

The Royce Instrument Corporation Model 2511 Interface Level Analyzer system consists of three main components - a sensor unit, an analyzer unit, and a data acquisition system The system uses an ultrasonic ranging technique (SONAR) to measure the depth of sludge blanket interfaces within holding tanks A small sensor mounted on the end of a 3/4" diameter pipe is placed just under the surface of the liquid An ultrasonic signal is sent and received through the sensor and forwarded by coaxial cable to the analyzer unit The analyzer unit processes the information and provides a visual readout of the sludge/liquid interface layer(s) and/or tank bottom position Specifics of the operation of the components are given below

Sensor Unit

The sensing unit, Model 25MRA, is a 2" diameter by 3" long probe with a 1/4" thick outer shell made of carbon fiber/epoxy composite material A piezoelectric crystal within the sensing unit acts as both a transmitter and receiver or "transceiver" Short, 212 hz bursts of ultrasonic energy transmitted from the crystal travel in a narrow beam towards the tank bottom and any resulting echoes are received in the same crystal

The outer shell of the sensor is designed to withstand extreme environmental conditions such as high temperatures and very corrosive materials Testing has also shown that there was no degradation of sensor performance after exposure to 5 x 10^6 RAD of gamma radiation

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2 5 GENERAL INFORMATION (Cont)

Analyzer Unit

The analyzer unit, Model 2511, measures the time delay and magnitude of the returning signals and stores this information in its memory in the form of a tank profile The procedure is repeated several times to filter anomalous returns until an average "clean" profile is developed The analyzer will adjust the power level of the transmitted signal based on the strength of returned signals Several factors will influence the strength of the returned signals The analyzer will attempt to adjust the power output to provide a signal return that will be easily distinguishable from the background noise Once the profile is stored in memory, the analyzer can determine the depth of the interface, the depth of the tank bottom, and the depth of any "fluff" layers suspended above the interface This information is then displayed both numerically and graphically on the front panel readout, or sent to a remote acquisition system where the same information can be displayed, manipulated and/or stored using vendor supplied software

Data Acquisition System

A microcomputer is connected to the analyzer assembly via an RS232 serial interface Data from the analyzer is then viewed using the software program provided by the vendor The software enables the user to view and record data from the analyzer to disk as standard American Standard Code For Information Interchange text data The data can be manipulated using other software such as spreadsheet or other programs

2 5 1 All entries recorded in this procedure shall be made in black ink

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2 5 GENERAL INFORMATION (Cont)

2 5 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 5 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 required by subsection 2 2 4, as each step is completed, the Recorder will check off (or enter "N/A" for), or initial each Test step as required in the spaces provided on the Working Copy of this Acceptance Test Procedure
- Any step that requires verification of data must also include recording data on the Working Copy

2 5 4 It is the intent to perform this Acceptance Test Procedure uninterrupted from beginning to end If testing is terminated due to time constraints at the end of an individual Test Section, the system will be placed in a safe configuration by the Test Director, with concurrence of the Test Engineer, and the terminated test configuration noted in the Acceptance Test Procedure Performance Log The test will restart at the next scheduled shift by establishing the noted test configuration, and documenting this in Acceptance Test Procedure Performance Log

2 5 5 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

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2 5 GENERAL INFORMATION (Cont)

2 5 6 When an exception is identified during testing, initiate an Acceptance Test Procedure Exception Record in the following manner (an example of a test exception would be when the system, fabricated per the design media, does not perform as expected)

- Number each exception sequentially as it occurs and record it on the Acceptance Test Procedure Exception Log
- Enter the sequential exception number, Date, and a description of the exception on an Acceptance Test Procedure Exception Record, identify additional detail as required
- Enter the name and/or the organization of the objecting party for each exception in the "Description of Exception" section of the Acceptance Test Procedure Exception Record
- Enter a description of actions planned to resolve each exception on the Acceptance Test Procedure Exception Record when such a determination is made

2 5 7 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 (the action taken does not have to be the same as the recorded planned action)
- 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 explanation may include why the system should be Accepted-As-Is The NHC Project Engineer then signs and dates the Resolution of Exception section of the Acceptance Test Procedure Exception Record, and obtains any other approvals required
- Distribute requisite copies of the completed Acceptance Test Procedure Exception Records to the client at the completion of the Acceptance Test Procedure

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2 5 GENERAL INFORMATION (Cont)

2 5 8 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 three 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 5 9 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 5 10 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

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2 5 GENERAL INFORMATION (Cont)

2 5 11 The completed test may be approved with test exceptions outstanding

- Check applicable space on Test Execution Sheet to show that this procedure has been performed with exceptions recorded, part or all of which are presently outstanding, unresolved
- 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
- All outstanding exceptions shall be added to project punchlist

3 0 PRECAUTIONS AND LIMITATIONS

3 1 PERSONNEL SAFETY

3 1 1 Individuals shall carry out their assigned work in a safe manner to protect themselves, others, and the equipment from undue hazards and to prevent damage to property and environment

3 1 2 Test Director shall assure the safety of all activities within their areas to prevent injury, property damage, or interruption of operation

3 1 3 Any hazard identified during the performance of the procedure shall be reported to the Test Director IMMEDIATELY

3 1 4 A daily pre-job safety briefing will be held with all test participants and documented in the Pre-Job Safety form (JSA or Pre Job Safety form)

3 1 5 Performance of test activities shall always include safety and health aspects as delineated in the Operations Manuals and as directed by the Test Director

3 2 RADIATION AND CONTAMINATION CONTROL

3 2 1 When performed without a work package, this procedure is limited to radiological areas and work activities permitted by a general radiation work permit

3 2 2 When work is performed in or when work will result in a high contamination, high radiation, or an airborne radioactive area, then an approved Job Control System work package must be developed which is reviewed by Radiological Control per the ALARA procedure HNF-IP-0842, Volume VII, Section 1 1

4 0 PREREQUISITES

4 1 SPECIAL TOOLS, EQUIPMENT, AND SUPPLIES

4 1 1 The following supplies shall be available at the test site

PROVIDED

- Ultrasonic Interface Level Analyzer Assembly
- Operator personal computer and Monitor
- Computer Cable from personal computer to Analyzer
- Software program

PROCURED

- Signal cable (temporary) from terminal box to transceiver, length as required
- Terminal box, reference Figure 1
- Test tank, minimum length 6 feet

To Be Supplied by Test Facility

- Miscellaneous items for Ultrasonic Interface Level Analyzer assembly set up and electrical/instrument connections

4 2 PERFORMANCE DOCUMENTS

The following procedures may be needed to perform this procedure

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- Vendor Information manuals

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4 3 CONDITIONS AND ACTIONS

The following conditions must be met before this Acceptance Test Procedure (ATP) may commence

NOTE- All signators on this procedure shall document their signature on Procedure Signature Sheet

4 3 1 All field testing and inspection of the system or portions of the system to be tested has been completed

Daniel M Stenkamp — Test Engineer Signature — 01/04/00 — Date

Daniel M Stenkamp — Test Engineer Print Name

4 3 2 A pre-job briefing has been held, and all participants have been thoroughly briefed on job safety, hazards, and their responsibilities before performing this Acceptance Test Procedure

J E Andrews — Test Director Signature — 1/4/00 — Date

J E Andrews — Test Director Print Name

4 3 3 Test Director **VERIFY** Section 4 0 has been COMPLETED by SIGNING below

J E Andrews — Test Director Signature — 1/4/00 — Date

J E Andrews — Test Director Print Name

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5 0 PROCEDURE

NOTE - This procedure shall be performed for each of the three Ultrasonic Interface Level Analyzer instrument assemblies This Procedure may be copied for use for each Ultrasonic Interface Level Analyzer assembly

5 1 Test Set Up

✓ 5 1 1 **RECORD** the unique Ultrasonic Interface Level Analyzer assembly number below

Assembly No WST-LY-703 (Riser 5B)

5 1 2 **ASSEMBLE** test equipment as follows (See figure 1)

✓ 5 1 2 1 **INSTALL** Ultrasonic Interface Level Analyzer assembly and test tank at test location

✓ 5 1 2 2 **ENSURE** power source to analyzer is on

✓ 5 1 2 3 **ENSURE** signal cable wires from temporary terminal box to transceiver are connected per Figure 1

✓ 5 1 2 4 **ENSURE** computer cable from analyzer to personal computer is connected

✓ 5 1 2 5 **ENSURE** the Royce Tank Profile software program has been installed on the personal computer

NOTE - In the following step a minimum of 6 feet of liquid SHALL be between the sensor and the test container wall The entire sensor SHALL be submerged A temporary wall may be inserted to determine the accuracy of distance readings

✓ 5 1 2 6 **ENSURE** tank is filled with water

✓ 5 1 2 7 **VERIFY** by signing below test set-up, section 5 1 has been completed

Ron Cowgill — 1/4/00
QC Signature — Date

QC Print Name

J E Andrews — 1/4/00
Test Director Signature — Date

JE Andrews
Test Director Print Name

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5 2 Ultrasonic Interface Level Analyzer CONFIGURATION AND TESTING

NOTE- The following settings are required to be made in the Ultrasonic Interface Level Analyzer enclosure for correct operation

NOTE - When the unit is turned on for the first time, it will be in the alarm condition A message will appear on the graphic panel that explains that the unit will not operate until the tank depth has been programmed (If the unit does not give this error message, it means a non-zero tank depth value has already been stored In this case, only the RUN light will light on the front panel)

_✓_ 5 2 1 **ENSURE** the power is "ON"

_✓_ 5 2 2 **PRESS** the "PGM" key to enter the analyzer "program" mode of operation The unit should display a HELP screen

NOTE - For purposes of testing the installation, temporary program parameters will be entered to allow verification of connections

_✓_ 5 2 3 **PRESS** the "NEXT PAGE" key to bring up the "DISPLAY FORMAT" help screen

_✓_ 5 2 4 **PUSH** the UP arrow key to select a value of 3 to display the depth of clear water in feet

_✓_ 5 2 5 **PRESS** the "NEXT PAGE" key again to bring up the "ECHO PROFILE UPDATE RATE" screen

_✓_ 5 2 6 **PUSH** the applicable arrow keys to select a value of 4 to have the Ultrasonic Interface Level Analyzer average a minutes worth of tank profiles

_✓_ 5 2 7 **PRESS** the NEXT PAGE key to bring up the "INTERFACE LEVEL AVERAGING CYCLES" screen

_✓_ 5 2 8 **PUSH** the applicable arrow keys to select a value of 5 to average 5 profile groups

_✓_ 5 2 9 **PRESS** the PREV PAGE key to scroll back to the "TANK DEPTH" screen

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5 2 Ultrasonic Interface Level Analyzer CONFIGURATION AND TESTING (Cont)

NOTE - For the purpose of this section "TANK DEPTH" refers to the distance between the sensor and the temporary wall of the test vessel The "Bottom" of the tank may be the temporary wall of the test vessel

✓ 5.2.10 **RECORD** the measured distance between the sensor and the temporary tank wall.

Measured distance 6 . 2 feet.

✓ 5 2 11 **ENTER** a ~~temporary~~ tank depth in the analyzer in feet that is at least two feet deeper than the ~~actual~~ temporary tank depth (length)

~~**RECORD the below**~~

~~Tank Depth _____ _____ feet~~

NOTE - After the following step, the display will go blank for a minute or so while the unit attempts to adjust transmitter power to the condition of the test tank After this delay, an "echo profile" graph will appear in the LCD display The numbers along the side of the graph indicate the depth in feet from the top of the tank At each depth, the magnitude of the graph indicates the strength of the echo energy that is returning from that spot on the tank At the very bottom of the graph, the unit will display a message to indicate the transmitter power (GAIN) that is being used to create this graph

✓ 5 2 12 **PRESS** the RUN key

NOTE - The graph should show an obvious bump other than the bump on the top The bump on the very top is ignored in the next step

✓ 5 2 13 **VERIFY** there is at least one obvious bump in the graph

J E Andrews 1/4/00
Test Director Signature Date

J E Andrews
Test Director Print Name

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5 2 Ultrasonic Interface Level Analyzer CONFIGURATION AND TESTING (Cont)

NOTE - In the next step the tank bottom should appear as a sharp peak in the graph at some reading above zero, depending on the value used in step 5 2 11

✓ 5 2 14 **EXAMINE** the graph to see if the position of the temporary tank bottom is apparent

✓ 5 2 15 **ENTER** the exact tank bottom position shown on the graph to the nearest tenth of a foot

Tank Bottom Position 6 4 feet

✓ 5 2 16 **CALCULATE** the accuracy of Ultrasonic Interface Level Analyzer measurement ~~value from 5 2 10 - 5 2 14 = _____ feet~~ by comparing the measured distance of sensor to temporary bottom, and the distance shown on the analyzer.

✓ 5 2 17 **VERIFY** accuracy is within +/- 0 3 feet

J E Andrews 1/4/00
Test Director Signature Date

JE Andrews
Test Director Print Name

✓ 5 2 18 **RECORD** the transmitter power (Gain) used to create the graph 3%

✓ 5 2 19 **VERIFY** Gain is less than 5

J E Andrews 1/4/00
Test Director Signature Date

JE Andrews
Test Director Print Name

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5 2 Ultrasonic Interface Level Analyzer CONFIGURATION AND TESTING (Cont)

✓ 5 2 20 **VERIFY** that the graphical profile readings ~~and numerical sludge level~~ are displayed at the Ultrasonic Interface Level Analyzer personal computer monitor

JE Andrews — 1/4/00
Test Director Signature — Date

JE Andrews
Test Director Print Name

NOTE - The Test Sections of this procedure may be copied to perform the following step as many times as necessary

✓ 5 2 21 **REPEAT** testing sections per Test Director for each URSILLA sensing unit to be tested

✓ 5 2 22 **VERIFY** that Testing is COMPLETE by SIGNING below

[signature] — 1-4-00
QC Signature — Date

Ron Cowain
QC Print Name

JE Andrews — 1/4/00
Test Director Signature — Date

JE Andrews
Test Director Print Name

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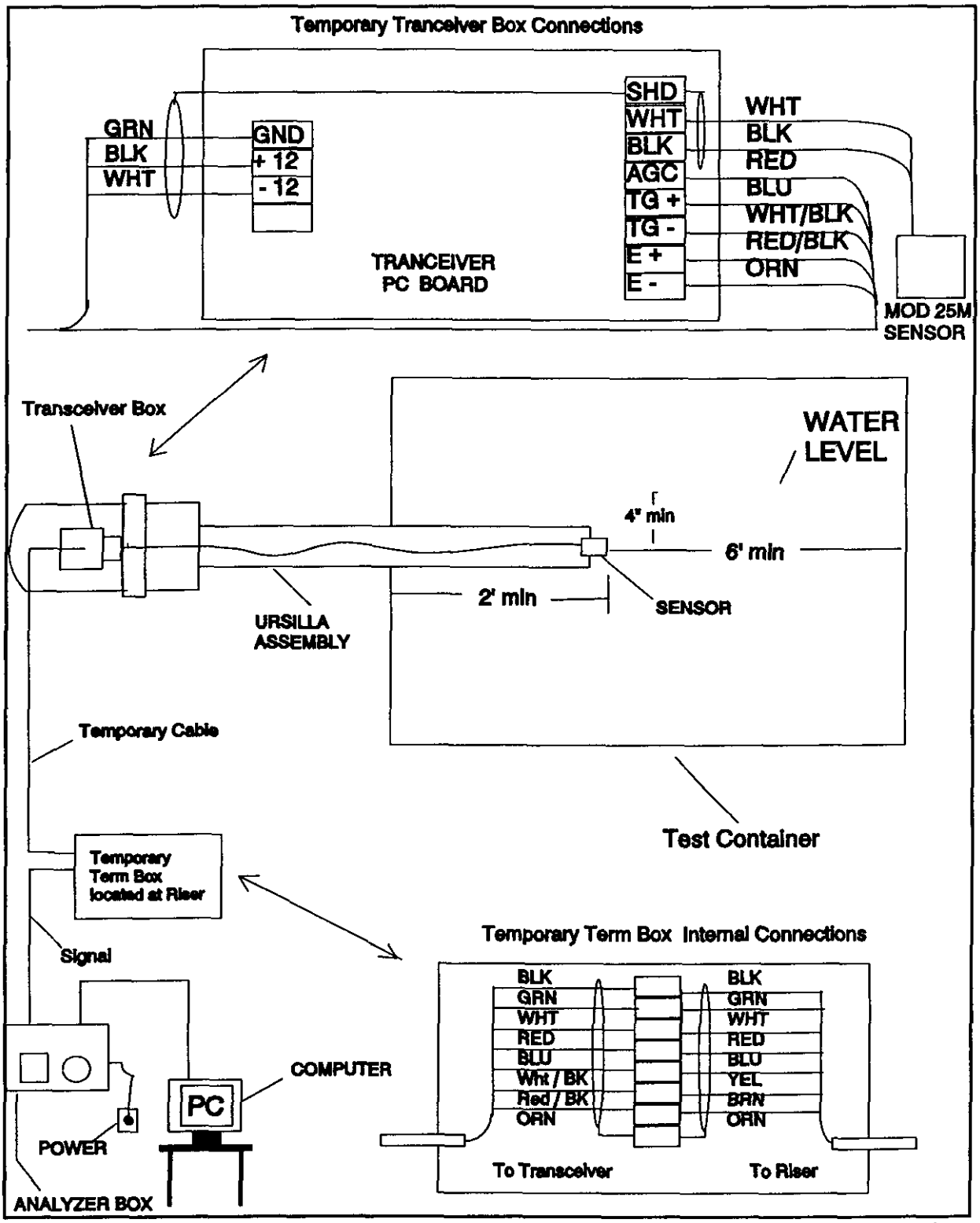
FIGURE 1



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ACCEPTANCE TEST PROCEDURE PERFORMANCE LOG

This page may be reproduced as necessary Page _____ of _____

ATP PERFORMANCE EVENT	DATE	INITIALS
Completed testing of WST-LY-703	1/4/00	
Analyzer and probe satisfactorily.		
No exceptions		JG

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ACCEPTANCE TEST PROCEDURE EXCEPTION LOG

This page may be reproduced as necessary Page _____ of _____

Number	Date	Description

N A JEAnder 1/4/00

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ACCEPTANCE TEST PROCEDURE EXCEPTION RECORD

This page may be reproduced as necessary Page _____ of _____

ATP Step Number	ATP Exception Log#
Description of Exception	
Name / Organization Of Initiator	
Date of Exception	
Resolution of Exception	
Date of Resolution	
Test Director Signature	Date
Test Engineer Signature	Date
Quality Assurance Signature	Date

N A Jeander 1/4/00

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PROCEDURE SIGNATURE SHEET

PRINT NAME	SIGNATURE	INITIALS
Ron Cowgill		RC
JE Andrews		JEA
Tom Clarke		TTC
Dan Steenkamp		DMS
Gary R Tardiff		GRT

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PROCEDURE HISTORY SIGNATURE SHEET

Last Full Revision A-0		
Release Date 11/22/99		
USQ Screening Number TF-99-0899 REV 0		
Approval Designator SQ		
Current Modification A-0		
USQ Screening Number TF-99-0899 REV 0		
Approval Designator SQ		
PCA Incorporated N/A		
POSITION/ORG	**DELEGATE**	**DATE**
Inst	James L. Williams	11/19/99
LNCO/OPS	S R. Joseph	11/19/99
QAE/QA	Charles A.Sams	11/22/99
Shift Manager	J.E. Andrews	11/19/99
Safety	R.A Huckfeldt	11/22/99
OTHER	P.C. Miller	11/22/99
RAD CON	Bob Brown	11/22/99
Cog Eng	Gary R. Tardiff	11/19/99
Acceptance Review	David W.VanDyke	11/23/99
Approval Authority	David A Selle	11/23/99
Justification New equipment pre installation testing		
Summary of Changes New Procedure		

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Last Full Revision A-0
Release Date 11/22/99
USQ Screening Number TF-99-0899 REV 0
Approval Designator SQ

Current Modification A-1
USQ Screening Number TF-98-1201 REV 1
Approval Designator N/A
PCA Incorporated ETF-99-747

POSITION/ORG	DELEGATE	DATE
LNCO/OPS	E.R. Caraway	12/16/99
Shift Manager	J.E Andrews	12/16/99
Cog Eng	Dan Reberger	12/16/99
Acceptance Review	David W.VanDyke	12/16/99
Approval Authority	J E Andrews	12/16/99

Justification Ops Request

Summary of Changes Word Changes on Page 17 & 18

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ATTACHMENT 2

COMPLETED COPY OF ATP-260-001 FOR ANALYZER WST-LY-704

Record Copy

WST-LY-704 (Riser l

URSILLA PRE-INSTALLATION ACCEPTANCE TEST PROCEDURE

Last Full Revision A-0		
Release Date 11/22/99		
USQ Screening Number TF-99-0899 REV 0		
Approval Designator SQ		
Current Modification A-2		
USQ Screening Number TF-98-1201 REV 1		
Approval Designator Q		
PCA Incorporated ETF-99-751		
POSITION/ORG	**DELEGATE**	**DATE**
LNCO/OPS	Vicki Miller	12/17/99
QA Eng	W.L Adams	12/17/99
Shift Manager	J E Andrews	12/17/99
Cog Eng	W.M. Harty Jr.	12/17/99
Acceptance Review	David W VanDyke	12/17/99
Approval Authority	J E Andrews	12/17/99
Justification Ops Request		
Summary of Changes Word Changes on Steps 5 2 10, 5 2 11, 5 2 14, 5 2 16 and 5 2 20		

The NEXT DUE DATE - 12/17/2001 -

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TEST EXECUTION SHEET

DATE 12/17/99	DOCUMENT NUMBER:
DOCUMENT TITLE: URSILLA PRE-INSTALLATION ACCEPTANCE TEST PROCEDURE	
TEST PERSONNEL (PRINT NAMES)	
TEST DIRECTOR Jeff Andrews	AUTHORIZED INSPECTOR Randy Dykeman
TEST ENGINEER Dan Stenkamp	RECORDER Jeff Andrews
TEST EXECUTION	
TEST DIRECTOR SIGNATURE/DATE JrAndrews / 12/17/99	TEST ENGINEER SIGNATURE/DATE Daniel M Stenkamp 12/17/99
	RECORDER SIGNATURE/DATE JrAndrews / 12/17/99
APPROVAL AND ACCEPTANCE OF TEST RESULTS	
WITHOUT EXCEPTION ✓ (✓) WITH EXCEPTIONS RESOLVED ____ (✓) WITH EXCEPTIONS REMAINING ____ (✓)	
TEST DIRECTOR SIGNATURE/DATE JrAndrews / 12/17/99	PROJECT MANAGER SIGNATURE/DATE 1-11-00
TEST ENGINEER SIGNATURE/DATE Daniel M Stenkamp 12/17/99	QUALITY ASSURANCE SIGNATURE/DATE WZ Adams 1/10/00
AUTHORIZED INSPECTOR SIGNATURE/DATE Randy Dykeman 01/04/00	DESIGN AUTHORITY SIGNATURE/DATE 1-5-00

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1 0 PURPOSE AND SCOPE

1 1 PURPOSE

The purpose of this procedure is to test the ability of the Ultrasonic Interface Level Analyzer (URSILLA), Instrument Assemblies to perform data collection functions per design specifications

1 2 SCOPE

This Pre Operational Acceptance Test Procedure will test the functional components, and the ability to collect data with a STAND-ALONE software system

2 0 INFORMATION

2 1 TERMS AND DEFINITIONS

2 1 1 Tank Depth- Distance between sensor and test container wall

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2 2 RESPONSIBILITIES

2 2 1 Each company or organization participating in the conduct of this procedure will designate personnel to assume the responsibilities and duties as defined herein for their respective roles The names of these designees shall be provided to the Recorder for listing on the Working Copy of the Test Execution Sheet prior to the performance of any part of this procedure

2 2 2 The Lockheed Martin Hanford Corporation Project Manager is responsible for the following

- Designation of a test director
- Signing the Test Execution Sheet when the Acceptance Test Procedure is approved and accepted as complete
- Signing for operations where applicable in this procedure
- Performing a Post-Test Review of Acceptance Test documentation

2 2 3 The Test Director is responsible for the following

- Signing for operations where applicable in this procedure
- Performing a Post-Test Review of Acceptance Test documentation
- Setting the safe boundaries for performing this procedure
- Coordination of all acceptance testing
- Signing the Acceptance Test Procedure Exception Record when a test exception has been resolved
- Preparing and issuing an Acceptance Test Report for the approved and accepted Acceptance Test Procedure when testing is completed
- Scheduling and conducting a pre-test meeting with acceptance test participants prior to start of testing

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2 2 RESPONSIBILITIES (Cont)

- Notification of the persons performing and witnessing the test prior to the start of testing
- Notification of all concerned parties when a change is made in the testing schedule
- Acting as liaison between the participants in acceptance testing
- Stopping any test which may cause damage to the system until the Acceptance Test Procedure has been revised
- Approving field changes to the Acceptance Test Procedure in accordance with Section 2 5
- Obtaining revisions to the Acceptance Test Procedure, as necessary, to comply with authorized field changes or to accommodate existing field conditions in accordance with Section 2 5
- Taking necessary actions to clear exceptions to the Acceptance Test Procedure
- Evaluating recorded data, discrepancies, and exceptions

2 2 4 The Recorder is responsible for the following

- Performing all recording duties using black ink
- Recording the names of all designated personnel on the Working Copy of this procedure prior to start of testing
- Observing tests, recording test data, and maintaining the Acceptance Test Procedure Performance Log
- Signing the Test Execution Sheet as the Recorder
- Ensuring every test verification step requiring signature on the Working Copy of this Acceptance Test Procedure is successfully performed, to indicate that Acceptance Criterion has been met
- Recording authorized field changes to this Acceptance Test Procedure

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2 2 RESPONSIBILITIES (Cont)

- Recording Test Exceptions and individual Test Procedure steps that are not performed satisfactorily on the Acceptance Test Procedure Exception Record and ensuring that the information is transferred (in ink or typed) to the master Working Copy of Acceptance Test Procedure Exception Record(s) Additional Acceptance Test Procedure Exception Records are to be added as needed

- Notifying the Test Director at the time any objection is made during performance of the Acceptance Test Procedure

- Submitting the completed master Working Copy of this Acceptance Test Procedure to the Test Director for approval signatures and distribution

2 2 5 The Test Engineer is responsible for the following

- Ensuring all equipment required for performing this Acceptance Test Procedure listed in Section 4 1 will be available at the start of testing

- Obtaining any information or changes necessary to clear or resolve objections

- Providing technical input to test personnel as needed relating to the configuration of equipment and systems to be tested and utilized in this procedure

- Post Review of Acceptance Test Documentation

2 2 6 The Quality Assurance Representative is responsible for the following

- Review and approval of test exception resolutions

- Performing a Post-Test Review of Acceptance Test documentation

- Review and approval of test results

2 2 7 QC Inspector is responsible for witnessing test execution and signing the completed sections of the test

2 2 8 The Authorized Inspector is responsible for the following

- Witnessing test execution

- Approval and signature of acceptance upon completion of this procedure

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2 3 RECORDS

2 3 1 The completed master "Working Copy" of this Acceptance Test Procedure, Acceptance test report,the completed "Test Execution Sheet", the completed "Acceptance Test Procedure Performance Log" and "Acceptance Test Procedure Exception Log", and all "Test Exception Sheets" generated during performance of this Acceptance Test Procedure will be kept as permanent records

2 4 REFERENCES

2 4 1 The following documents were used to write or are referenced in this procedure

- ROYCE instrument Corporation, *Model 2511, Interface Level Analyzer Operators Manual*, New Orleans, La , VIN 0022515, Supplement 041
- ROYCE instrument Corporation, *Model 2511, Interface Level Analyzer Profile Program Instructions*, New Orleans, La VIN 0022515, Supplement 041
- Witwer, K S , 1995a, *Status on Royce Interface Level Detector*, Internal Memo to G T Maclean, May 3, 1995
- Witwer, K S , 1995b, *Current Status and Results of Royce Ultrasonic Sensor Testing*, Memo to G T Maclean, September 19, 1995
- Witwer, K S , 1999, *Report on Testing of the Royce Interface Level Analyzer*, HNF-3782, Rev 0, February 25, 1999, Numatec Hanford Company, Richland , Washington

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2 5 GENERAL INFORMATION

VENDOR INFORMATION

The Royce Instrument Corporation Model 2511 Interface Level Analyzer (URSILLA) system uses an ultrasonic ranging technique (SONAR) to measure sludge depths in holding tanks Three Ultrasonic Interface Level Analyzer instrument assemblies provided by the W-151 project are planned to be used during mixer pump testing to provide data for determining sludge mobilization effectiveness of the mixer pumps and sludge settling rates

The Royce Instrument Corporation Model 2511 Interface Level Analyzer system consists of three main components - a sensor unit, an analyzer unit, and a data acquisition system The system uses an ultrasonic ranging technique (SONAR) to measure the depth of sludge blanket interfaces within holding tanks A small sensor mounted on the end of a 3/4" diameter pipe is placed just under the surface of the liquid An ultrasonic signal is sent and received through the sensor and forwarded by coaxial cable to the analyzer unit The analyzer unit processes the information and provides a visual readout of the sludge/liquid interface layer(s) and/or tank bottom position Specifics of the operation of the components are given below

Sensor Unit

The sensing unit, Model 25MRA, is a 2" diameter by 3" long probe with a 1/4" thick outer shell made of carbon fiber/epoxy composite material A piezoelectric crystal within the sensing unit acts as both a transmitter and receiver or "transceiver" Short, 212 hz bursts of ultrasonic energy transmitted from the crystal travel in a narrow beam towards the tank bottom and any resulting echoes are received in the same crystal

The outer shell of the sensor is designed to withstand extreme environmental conditions such as high temperatures and very corrosive materials Testing has also shown that there was no degradation of sensor performance after exposure to 5 x 10^6 RAD of gamma radiation

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2 5 GENERAL INFORMATION (Cont)

Analyzer Unit

The analyzer unit, Model 2511, measures the time delay and magnitude of the returning signals and stores this information in its memory in the form of a tank profile The procedure is repeated several times to filter anomalous returns until an average "clean" profile is developed The analyzer will adjust the power level of the transmitted signal based on the strength of returned signals Several factors will influence the strength of the returned signals The analyzer will attempt to adjust the power output to provide a signal return that will be easily distinguishable from the background noise Once the profile is stored in memory, the analyzer can determine the depth of the interface, the depth of the tank bottom, and the depth of any "fluff" layers suspended above the interface This information is then displayed both numerically and graphically on the front panel readout, or sent to a remote acquisition system where the same information can be displayed, manipulated and/or stored using vendor supplied software

Data Acquisition System

A microcomputer is connected to the analyzer assembly via an RS232 serial interface Data from the analyzer is then viewed using the software program provided by the vendor The software enables the user to view and record data from the analyzer to disk as standard American Standard Code For Information Interchange text data The data can be manipulated using other software such as spreadsheet or other programs

2 5 1 All entries recorded in this procedure shall be made in black ink

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2 5 GENERAL INFORMATION (Cont)

2 5 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 5 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 required by subsection 2 2 4, as each step is completed, the Recorder will check off (or enter "N/A" for), or initial each Test step as required in the spaces provided on the Working Copy of this Acceptance Test Procedure
- Any step that requires verification of data must also include recording data on the Working Copy

2 5 4 It is the intent to perform this Acceptance Test Procedure uninterrupted from beginning to end If testing is terminated due to time constraints at the end of an individual Test Section, the system will be placed in a safe configuration by the Test Director, with concurrence of the Test Engineer, and the terminated test configuration noted in the Acceptance Test Procedure Performance Log The test will restart at the next scheduled shift by establishing the noted test configuration, and documenting this in Acceptance Test Procedure Performance Log

2 5 5 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

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2 5 GENERAL INFORMATION (Cont)

2 5 6 When an exception is identified during testing, initiate an Acceptance Test Procedure Exception Record in the following manner (an example of a test exception would be when the system, fabricated per the design media, does not perform as expected)

- Number each exception sequentially as it occurs and record it on the Acceptance Test Procedure Exception Log
- Enter the sequential exception number, Date, and a description of the exception on an Acceptance Test Procedure Exception Record, identify additional detail as required
- Enter the name and/or the organization of the objecting party for each exception in the "Description of Exception" section of the Acceptance Test Procedure Exception Record
- Enter a description of actions planned to resolve each exception on the Acceptance Test Procedure Exception Record when such a determination is made

2 5 7 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 (the action taken does not have to be the same as the recorded planned action)
- 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 explanation may include why the system should be Accepted-As-Is The NHC Project Engineer then signs and dates the Resolution of Exception section of the Acceptance Test Procedure Exception Record, and obtains any other approvals required
- Distribute requisite copies of the completed Acceptance Test Procedure Exception Records to the client at the completion of the Acceptance Test Procedure

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2 5 GENERAL INFORMATION (Cont)

2 5 8 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 three 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 5 9 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 5 10 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

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2 5 GENERAL INFORMATION (Cont)

2 5 11 The completed test may be approved with test exceptions outstanding

- Check applicable space on Test Execution Sheet to show that this procedure has been performed with exceptions recorded, part or all of which are presently outstanding, unresolved
- 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
- All outstanding exceptions shall be added to project punchlist

3 0 PRECAUTIONS AND LIMITATIONS

3 1 PERSONNEL SAFETY

3 1 1 Individuals shall carry out their assigned work in a safe manner to protect themselves, others, and the equipment from undue hazards and to prevent damage to property and environment

3 1 2 Test Director shall assure the safety of all activities within their areas to prevent injury, property damage, or interruption of operation

3 1 3 Any hazard identified during the performance of the procedure shall be reported to the Test Director IMMEDIATELY

3 1 4 A daily pre-job safety briefing will be held with all test participants and documented in the Pre-Job Safety form (JSA or Pre Job Safety form)

3 1 5 Performance of test activities shall always include safety and health aspects as delineated in the Operations Manuals and as directed by the Test Director

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3 2 RADIATION AND CONTAMINATION CONTROL

3 2 1 When performed without a work package, this procedure is limited to radiological areas and work activities permitted by a general radiation work permit

3 2 2 When work is performed in or when work will result in a high contamination, high radiation, or an airborne radioactive area, then an approved Job Control System work package must be developed which is reviewed by Radiological Control per the ALARA procedure HNF-IP-0842, Volume VII, Section 1 1

4 0 PREREQUISITES

4 1 SPECIAL TOOLS, EQUIPMENT, AND SUPPLIES

4 1 1 The following supplies shall be available at the test site

PROVIDED

- Ultrasonic Interface Level Analyzer Assembly
- Operator personal computer and Monitor
- Computer Cable from personal computer to Analyzer
- Software program

PROCURED

- Signal cable (temporary) from terminal box to transceiver, length as required
- Terminal box, reference Figure 1
- Test tank, minimum length 6 feet

To Be Supplied by Test Facility

- Miscellaneous items for Ultrasonic Interface Level Analyzer assembly set up and electrical/instrument connections

4 2 PERFORMANCE DOCUMENTS

The following procedures may be needed to perform this procedure

- Vendor Information manuals

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4 3 CONDITIONS AND ACTIONS

The following conditions must be met before this Acceptance Test Procedure (ATP) may commence

NOTE- All signators on this procedure shall document their signature on Procedure Signature Sheet

4 3 1 All field testing and inspection of the system or portions of the system to be tested has been completed

Daniel M. Stevkamp — 12/17/99
Test Engineer Signature — Date

Daniel M. Stevkamp
Test Engineer Print Name

4 3 2 A pre-job briefing has been held, and all participants have been thoroughly briefed on job safety, hazards, and their responsibilities before performing this Acceptance Test Procedure

JE Andrews — 12/17/99
Test Director Signature — Date

JE Andrews
Test Director Print Name

4 3 3 Test Director **VERIFY** Section 4 0 has been COMPLETED by SIGNING below

JE Andrews — 12/17/99
Test Director Signature — Date

JE Andrews
Test Director Print Name

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5 0 PROCEDURE

NOTE - This procedure shall be performed for each of the three Ultrasonic Interface Level Analyzer instrument assemblies This Procedure may be copied for use for each Ultrasonic Interface Level Analyzer assembly

5 1 Test Set Up

✓ 5 1 1 **RECORD** the unique Ultrasonic Interface Level Analyzer assembly number below

Assembly No WST-LY-704 (Riser 16C)

5 1 2 **ASSEMBLE** test equipment as follows (See figure 1)

✓ 5 1 2 1 **INSTALL** Ultrasonic Interface Level Analyzer assembly and test tank at test location

✓ 5 1 2 2 **ENSURE** power source to analyzer is on

✓ 5 1 2 3 **ENSURE** signal cable wires from temporary terminal box to transceiver are connected per Figure 1

✓ 5 1 2 4 **ENSURE** computer cable from analyzer to personal computer is connected

✓ 5 1 2 5 **ENSURE** the Royce Tank Profile software program has been installed on the personal computer

NOTE - In the following step a minimum of 6 feet of liquid SHALL be between the sensor and the test container wall The entire sensor SHALL be submerged A temporary wall may be inserted to determine the accuracy of distance readings

✓ 5 1 2 6 **ENSURE** tank is filled with water

✓ 5 1 2 7 **VERIFY** by signing below test set-up, section 5 1 has been completed

Paul A Werner — 12-17-99
QC Signature — Date

Paul A Werner
QC Print Name

J E Andrews — 12/17/99
Test Director Signature — Date

JE Andrews
Test Director Print Name

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5 2 Ultrasonic Interface Level Analyzer CONFIGURATION AND TESTING

NOTE- The following settings are required to be made in the Ultrasonic Interface Level Analyzer enclosure for correct operation

NOTE - When the unit is turned on for the first time, it will be in the alarm condition A message will appear on the graphic panel that explains that the unit will not operate until the tank depth has been programmed (If the unit does not give this error message, it means a non-zero tank depth value has already been stored In this case, only the RUN light will light on the front panel)

_✓_ 5 2 1 **ENSURE** the power is "ON"

_✓_ 5 2 2 **PRESS** the "PGM" key to enter the analyzer "program" mode of operation The unit should display a HELP screen

NOTE - For purposes of testing the installation, temporary program parameters will be entered to allow verification of connections

_✓_ 5 2 3 **PRESS** the "NEXT PAGE" key to bring up the "DISPLAY FORMAT" help screen

_✓_ 5 2 4 **PUSH** the UP arrow key to select a value of 3 to display the depth of clear water in feet

_✓_ 5 2 5 **PRESS** the "NEXT PAGE" key again to bring up the "ECHO PROFILE UPDATE RATE" screen

_✓_ 5 2 6 **PUSH** the applicable arrow keys to select a value of 4 to have the Ultrasonic Interface Level Analyzer average a minutes worth of tank profiles

_✓_ 5 2 7 **PRESS** the NEXT PAGE key to bring up the "INTERFACE LEVEL AVERAGING CYCLES" screen

_✓_ 5 2 8 **PUSH** the applicable arrow keys to select a value of 5 to average 5 profile groups

_✓_ 5 2 9 **PRESS** the PREV PAGE key to scroll back to the "TANK DEPTH" screen

5 2 Ultrasonic Interface Level Analyzer CONFIGURATION AND TESTING (Cont)

NOTE - For the purpose of this section "TANK DEPTH" refers to the distance between the sensor and the temporary wall of the test vessel The "Bottom" of the tank may be the temporary wall of the test vessel

✓ 5.2.10 **RECORD** the measured distance between the sensor and the temporary tank wall.

Measured distance 6 . 7 feet.

✓ 5 2 11 **ENTER** a ~~temporary~~ tank depth in the analyzer in feet that is at least two feet deeper than the ~~actual~~ temporary tank depth (length)

~~**RECORD** the below~~

~~Tank Depth _____ _____ feet~~

NOTE - After the following step, the display will go blank for a minute or so while the unit attempts to adjust transmitter power to the condition of the test tank After this delay, an "echo profile" graph will appear in the LCD display The numbers along the side of the graph indicate the depth in feet from the top of the tank At each depth, the magnitude of the graph indicates the strength of the echo energy that is returning from that spot on the tank At the very bottom of the graph, the unit will display a message to indicate the transmitter power (GAIN) that is being used to create this graph

✓ 5 2 12 **PRESS** the RUN key

NOTE - The graph should show an obvious bump other than the bump on the top The bump on the very top is ignored in the next step

✓ 5 2 13 **VERIFY** there is at least one obvious bump in the graph

JE Andrews 12/17/99
Test Director Signature Date

JE Andrews
Test Director Print Name

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5 2 Ultrasonic Interface Level Analyzer CONFIGURATION AND TESTING (Cont)

NOTE - In the next step the tank bottom should appear as a sharp peak in the graph at some reading above zero, depending on the value used in step 5 2 11

✓ 5 2 14 **EXAMINE** the graph to see if the position of the temporary tank bottom is apparent

✓ 5 2 15 **ENTER** the exact tank bottom position shown on the graph to the nearest tenth of a foot

Tank Bottom Position 7 0 feet

✓ 5 2 16 **CALCULATE** the accuracy of Ultrasonic Interface Level Analyzer measurement ~~value from 5 2 10 - 5 2 14 = _____ feet~~ by comparing the measured distance of sensor to temporary bottom, and the distance shown on the analyzer.

✓ 5 2 17 **VERIFY** accuracy is within +/- 0 3 feet

J E Andrews — 12/17/99
Test Director Signature — Date

JE Andrews
Test Director Print Name

✓ 5 2 18 **RECORD** the transmitter power (Gain) used to create the graph 1%

✓ 5 2 19 **VERIFY** Gain is less than 5

J E Andrews — 12/17/99
Test Director Signature — Date

JE Andrews
Test Director Print Name

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5 2 Ultrasonic Interface Level Analyzer CONFIGURATION AND TESTING (Cont)

✓ 5 2 20 **VERIFY** that the graphical profile readings ~~and numerical sludge level~~ are displayed at the Ultrasonic Interface Level Analyzer personal computer monitor

JE Andrews — 12/17/99
Test Director Signature — Date

JE Andrews
Test Director Print Name

NOTE - The Test Sections of this procedure may be copied to perform the following step as many times as necessary

✓ 5 2 21 **REPEAT** testing sections per Test Director for each URSILLA sensing unit to be tested

✓ 5 2 22 **VERIFY** that Testing is COMPLETE by SIGNING below

Paul A Werner — 12-17-99
QC Signature — Date

Paul A Werner
QC Print Name

JE Andrews — 12/17/99
Test Director Signature — Date

JE Andrews
Test Director Print Name

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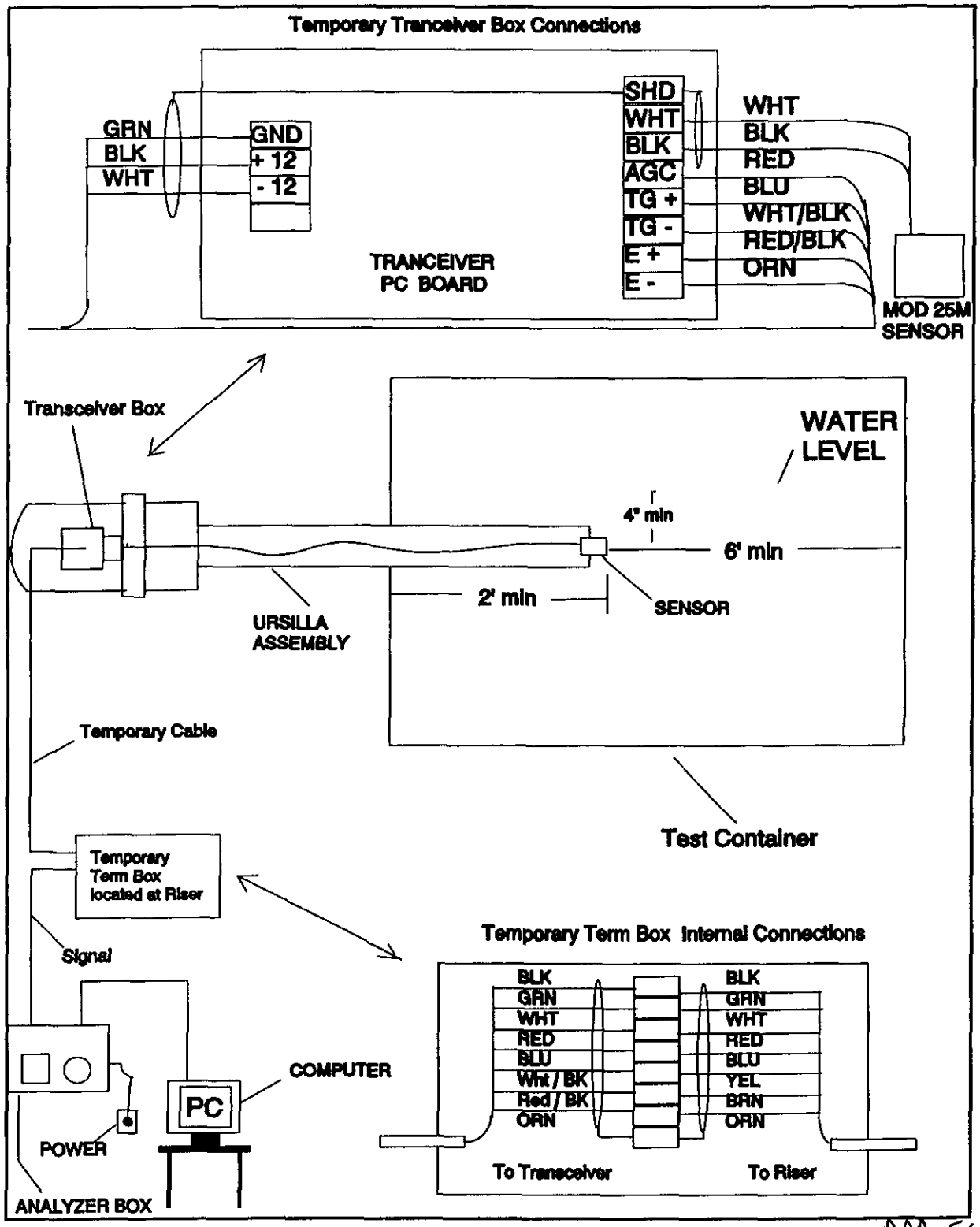
FIGURE 1



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ACCEPTANCE TEST PROCEDURE PERFORMANCE LOG

This page may be reproduced as necessary Page 1 of 1

ATP PERFORMANCE EVENT	DATE	INITIALS
Completed testing of WST-LY-704 (Riser 16C) Analyzer and probe satisfactorily, with "no" exceptions	12/17/99	JJ

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ACCEPTANCE TEST PROCEDURE EXCEPTION LOG

This page may be reproduced as necessary Page _____ of _____

Number	Date	Description

N/A 12/17/99

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ACCEPTANCE TEST PROCEDURE EXCEPTION RECORD

This page may be reproduced as necessary Page _____ of _____

ATP Step Number	ATP Exception Log#
Description of Exception	
Name / Organization Of Initiator	
Date of Exception	
Resolution of Exception	
Date of Resolution	
Test Director Signature	Date
Test Engineer Signature	Date
Quality Assurance Signature	Date

N A JEAnder 12/17/99

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PROCEDURE SIGNATURE SHEET

PRINT NAME	SIGNATURE	INITIALS
Paul A Werner (QC)	Paul A. Werner	PAW
Dan Steenkamp	Dan Steenkamp	DMS
J E Andrews	J E Andrews	JEA
R Dykeman	R Dykeman	RD
Gary R Tardiff	Gary R Tardiff	GRT

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PROCEDURE HISTORY SIGNATURE SHEET

Last Full Revision A-0
Release Date 11/22/99
USQ Screening Number TF-99-0899 REV 0
Approval Designator SQ

Current Modification A-0
USQ Screening Number TF-99-0899 REV 0
Approval Designator SQ
PCA Incorporated N/A

POSITION/ORG	DELEGATE	DATE
Inst	James L. Williams	11/19/99
LNCO/OPS	S.R. Joseph	11/19/99
QAE/QA	Charles A.Sams	11/22/99
Shift Manager	J E. Andrews	11/19/99
Safety	R A. Huckfeldt	11/22/99
OTHER	P C Miller	11/22/99
RAD CON	Bob Brown	11/22/99
Cog Eng	Gary R. Tardiff	11/19/99
Acceptance Review	David W.VanDyke	11/23/99
Approval Authority	David A. Selle	11/23/99

Justification New equipment pre installation testing

Summary of Changes New Procedure

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Last Full Revision A-0		
Release Date 11/22/99		
USQ Screening Number TF-99-0899 REV 0		
Approval Designator SQ		
Current Modification A-1		
USQ Screening Number TF-98-1201 REV 1		
Approval Designator N/A		
PCA Incorporated ETF-99-747		
POSITION/ORG	DELEGATE	DATE
LNCO/OPS	E.R. Caraway	12/16/99
Shift Manager	J.E Andrews	12/16/99
Cog Eng	Dan Reberger	12/16/99
Acceptance Review	David W.VanDyke	12/16/99
Approval Authority	J.E. Andrews	12/16/99
Justification Ops Request		
Summary of Changes Word Changes on Page 17 & 18		

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ATTACHMENT 3

COMPLETED COPY OF ATP-260-001 FOR ANALYZER WST-LY-705

Record Copy WST-LY-705 (Riser 13A)

URSILLA PRE-INSTALLATION ACCEPTANCE TEST PROCEDURE

Last Full Revision A-0
Release Date 11/22/99
USQ Screening Number TF-99-0899 REV 0
Approval Designator SQ

Current Modification A-2
USQ Screening Number TF-98-1201 REV 1
Approval Designator Q
PCA Incorporated ETF-99-751

POSITION/ORG	DELEGATE	DATE
LNCO/OPS	Vicki Miller	12/17/99
QA Eng	W.L. Adams	12/17/99
Shift Manager	J E. Andrews	12/17/99
Cog Eng	W.M. Harty Jr.	12/17/99
Acceptance Review	David W.VanDyke	12/17/99
Approval Authority	J E Andrews	12/17/99

Justification Ops Request

Summary of Changes Word Changes on Steps 5 2 10, 5 2 11, 5 2 14, 5 2 16 and 5 2 20

The NEXT DUE DATE - 12/17/2001 -

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FIGURE 1 22

ACCEPTANCE TEST PROCEDURE PERFORMANCE LOG 23

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TEST EXECUTION SHEET

DATE 12/17/99	DOCUMENT NUMBER*
DOCUMENT TITLE: URSILLA PRE-INSTALLATION ACCEPTANCE TEST PROCEDURE	
TEST PERSONNEL (PRINT NAMES)	
TEST DIRECTOR JE Andrews	AUTHORIZED INSPECTOR Randy Dykeman
TEST ENGINEER Dan Stenkamp	RECORDER JE Andrews
TEST EXECUTION	
TEST DIRECTOR SIGNATURE/DATE JE Andrews / 12/17/99	TEST ENGINEER SIGNATURE/DATE Daniel M Stenkamp 12/17/99
	RECORDER SIGNATURE/DATE JE Andrews / 12/17/99
APPROVAL AND ACCEPTANCE OF TEST RESULTS	
WITHOUT EXCEPTION ✓ (✓)	WITH EXCEPTIONS RESOLVED ____ (✓) WITH EXCEPTIONS REMAINING ____ (✓)
TEST DIRECTOR SIGNATURE/DATE JE Andrews / 12/17/99	PROJECT MANAGER SIGNATURE/DATE 1-11-00
TEST ENGINEER SIGNATURE/DATE Daniel M Stenkamp 12/17/99	QUALITY ASSURANCE SIGNATURE/DATE WZ adams 1/10/00
AUTHORIZED INSPECTOR SIGNATURE/DATE Randy Dykeman TJ Clarke 01/04/00	DESIGN AUTHORITY SIGNATURE/DATE Daryl Tadlock 1-5-00

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1 0 PURPOSE AND SCOPE

1 1 PURPOSE

The purpose of this procedure is to test the ability of the Ultrasonic Interface Level Analyzer (URSILLA), Instrument Assemblies to perform data collection functions per design specifications

1 2 SCOPE

This Pre Operational Acceptance Test Procedure will test the functional components, and the ability to collect data with a STAND-ALONE software system

2 0 INFORMATION

2 1 TERMS AND DEFINITIONS

2 1 1	Tank Depth-	Distance between sensor and test container wall

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2 2 RESPONSIBILITIES

2 2 1 Each company or organization participating in the conduct of this procedure will designate personnel to assume the responsibilities and duties as defined herein for their respective roles The names of these designees shall be provided to the Recorder for listing on the Working Copy of the Test Execution Sheet prior to the performance of any part of this procedure

2 2 2 The Lockheed Martin Hanford Corporation Project Manager is responsible for the following

- Designation of a test director
- Signing the Test Execution Sheet when the Acceptance Test Procedure is approved and accepted as complete
- Signing for operations where applicable in this procedure
- Performing a Post-Test Review of Acceptance Test documentation

2 2 3 The Test Director is responsible for the following

- Signing for operations where applicable in this procedure
- Performing a Post-Test Review of Acceptance Test documentation
- Setting the safe boundaries for performing this procedure
- Coordination of all acceptance testing
- Signing the Acceptance Test Procedure Exception Record when a test exception has been resolved
- Preparing and issuing an Acceptance Test Report for the approved and accepted Acceptance Test Procedure when testing is completed
- Scheduling and conducting a pre-test meeting with acceptance test participants prior to start of testing

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2 2 RESPONSIBILITIES (Cont)

- Notification of the persons performing and witnessing the test prior to the start of testing
- Notification of all concerned parties when a change is made in the testing schedule
- Acting as liaison between the participants in acceptance testing
- Stopping any test which may cause damage to the system until the Acceptance Test Procedure has been revised
- Approving field changes to the Acceptance Test Procedure in accordance with Section 2 5
- Obtaining revisions to the Acceptance Test Procedure, as necessary, to comply with authorized field changes or to accommodate existing field conditions in accordance with Section 2 5
- Taking necessary actions to clear exceptions to the Acceptance Test Procedure
- Evaluating recorded data, discrepancies, and exceptions

2 2 4 The Recorder is responsible for the following

- Performing all recording duties using black ink
- Recording the names of all designated personnel on the Working Copy of this procedure prior to start of testing
- Observing tests, recording test data, and maintaining the Acceptance Test Procedure Performance Log
- Signing the Test Execution Sheet as the Recorder
- Ensuring every test verification step requiring signature on the Working Copy of this Acceptance Test Procedure is successfully performed, to indicate that Acceptance Criterion has been met
- Recording authorized field changes to this Acceptance Test Procedure

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2 2 RESPONSIBILITIES (Cont)

- Recording Test Exceptions and individual Test Procedure steps that are not performed satisfactorily on the Acceptance Test Procedure Exception Record and ensuring that the information is transferred (in ink or typed) to the master Working Copy of Acceptance Test Procedure Exception Record(s) Additional Acceptance Test Procedure Exception Records are to be added as needed

- Notifying the Test Director at the time any objection is made during performance of the Acceptance Test Procedure

- Submitting the completed master Working Copy of this Acceptance Test Procedure to the Test Director for approval signatures and distribution

2 2 5 The Test Engineer is responsible for the following

- Ensuring all equipment required for performing this Acceptance Test Procedure listed in Section 4 1 will be available at the start of testing

- Obtaining any information or changes necessary to clear or resolve objections

- Providing technical input to test personnel as needed relating to the configuration of equipment and systems to be tested and utilized in this procedure

- Post Review of Acceptance Test Documentation

2 2 6 The Quality Assurance Representative is responsible for the following

- Review and approval of test exception resolutions

- Performing a Post-Test Review of Acceptance Test documentation

- Review and approval of test results

2 2 7 QC Inspector is responsible for witnessing test execution and signing the completed sections of the test

2 2 8 The Authorized Inspector is responsible for the following

- Witnessing test execution

- Approval and signature of acceptance upon completion of this procedure

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2 3 RECORDS

2 3 1 The completed master "Working Copy" of this Acceptance Test Procedure, Acceptance test report,the completed "Test Execution Sheet", the completed "Acceptance Test Procedure Performance Log" and "Acceptance Test Procedure Exception Log", and all "Test Exception Sheets" generated during performance of this Acceptance Test Procedure will be kept as permanent records

2 4 REFERENCES

2 4 1 The following documents were used to write or are referenced in this procedure

- ROYCE instrument Corporation, *Model 2511, Interface Level Analyzer Operators Manual*, New Orleans, La , VIN 0022515, Supplement 041
- ROYCE instrument Corporation, *Model 2511, Interface Level Analyzer Profile Program Instructions*, New Orleans, La VIN 0022515, Supplement 041
- Witwer, K S , 1995a, *Status on Royce Interface Level Detector*, Internal Memo to G T Maclean, May 3, 1995
- Witwer, K S , 1995b, *Current Status and Results of Royce Ultrasonic Sensor Testing*, Memo to G T Maclean, September 19, 1995
- Witwer, K S , 1999, *Report on Testing of the Royce Interface Level Analyzer*, HNF-3782, Rev 0, February 25, 1999, Numatec Hanford Company, Richland , Washington

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2 5 GENERAL INFORMATION

VENDOR INFORMATION

The Royce Instrument Corporation Model 2511 Interface Level Analyzer (URSILLA) system uses an ultrasonic ranging technique (SONAR) to measure sludge depths in holding tanks Three Ultrasonic Interface Level Analyzer instrument assemblies provided by the W-151 project are planned to be used during mixer pump testing to provide data for determining sludge mobilization effectiveness of the mixer pumps and sludge settling rates

The Royce Instrument Corporation Model 2511 Interface Level Analyzer system consists of three main components - a sensor unit, an analyzer unit, and a data acquisition system The system uses an ultrasonic ranging technique (SONAR) to measure the depth of sludge blanket interfaces within holding tanks A small sensor mounted on the end of a 3/4" diameter pipe is placed just under the surface of the liquid An ultrasonic signal is sent and received through the sensor and forwarded by coaxial cable to the analyzer unit The analyzer unit processes the information and provides a visual readout of the sludge/liquid interface layer(s) and/or tank bottom position Specifics of the operation of the components are given below

Sensor Unit

The sensing unit, Model 25MRA, is a 2" diameter by 3" long probe with a 1/4" thick outer shell made of carbon fiber/epoxy composite material A piezoelectric crystal within the sensing unit acts as both a transmitter and receiver or "transceiver" Short, 212 hz bursts of ultrasonic energy transmitted from the crystal travel in a narrow beam towards the tank bottom and any resulting echoes are received in the same crystal

The outer shell of the sensor is designed to withstand extreme environmental conditions such as high temperatures and very corrosive materials Testing has also shown that there was no degradation of sensor performance after exposure to 5 x 10^6 RAD of gamma radiation

2 5 GENERAL INFORMATION (Cont)

Analyzer Unit

The analyzer unit, Model 2511, measures the time delay and magnitude of the returning signals and stores this information in its memory in the form of a tank profile The procedure is repeated several times to filter anomalous returns until an average "clean" profile is developed The analyzer will adjust the power level of the transmitted signal based on the strength of returned signals Several factors will influence the strength of the returned signals The analyzer will attempt to adjust the power output to provide a signal return that will be easily distinguishable from the background noise Once the profile is stored in memory, the analyzer can determine the depth of the interface, the depth of the tank bottom, and the depth of any "fluff" layers suspended above the interface This information is then displayed both numerically and graphically on the front panel readout, or sent to a remote acquisition system where the same information can be displayed, manipulated and/or stored using vendor supplied software

Data Acquisition System

A microcomputer is connected to the analyzer assembly via an RS232 serial interface Data from the analyzer is then viewed using the software program provided by the vendor The software enables the user to view and record data from the analyzer to disk as standard American Standard Code For Information Interchange text data The data can be manipulated using other software such as spreadsheet or other programs

2 5 1 All entries recorded in this procedure shall be made in black ink

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2 5 GENERAL INFORMATION (Cont)

2 5 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 5 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 required by subsection 2 2 4, as each step is completed, the Recorder will check off (or enter "N/A" for), or initial each Test step as required in the spaces provided on the Working Copy of this Acceptance Test Procedure
- Any step that requires verification of data must also include recording data on the Working Copy

2 5 4 It is the intent to perform this Acceptance Test Procedure uninterrupted from beginning to end If testing is terminated due to time constraints at the end of an individual Test Section, the system will be placed in a safe configuration by the Test Director, with concurrence of the Test Engineer, and the terminated test configuration noted in the Acceptance Test Procedure Performance Log The test will restart at the next scheduled shift by establishing the noted test configuration, and documenting this in Acceptance Test Procedure Performance Log

2 5 5 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

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2 5 GENERAL INFORMATION (Cont)

2 5 6 When an exception is identified during testing, initiate an Acceptance Test Procedure Exception Record in the following manner (an example of a test exception would be when the system, fabricated per the design media, does not perform as expected)

- Number each exception sequentially as it occurs and record it on the Acceptance Test Procedure Exception Log
- Enter the sequential exception number, Date, and a description of the exception on an Acceptance Test Procedure Exception Record, identify additional detail as required
- Enter the name and/or the organization of the objecting party for each exception in the "Description of Exception" section of the Acceptance Test Procedure Exception Record
- Enter a description of actions planned to resolve each exception on the Acceptance Test Procedure Exception Record when such a determination is made

2 5 7 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 (the action taken does not have to be the same as the recorded planned action)
- 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 explanation may include why the system should be Accepted-As-Is The NHC Project Engineer then signs and dates the Resolution of Exception section of the Acceptance Test Procedure Exception Record, and obtains any other approvals required
- Distribute requisite copies of the completed Acceptance Test Procedure Exception Records to the client at the completion of the Acceptance Test Procedure

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2 5 GENERAL INFORMATION (Cont)

2 5 8 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 three 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 5 9 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 5 10 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

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2 5 GENERAL INFORMATION (Cont)

2 5 11 The completed test may be approved with test exceptions outstanding

- Check applicable space on Test Execution Sheet to show that this procedure has been performed with exceptions recorded, part or all of which are presently outstanding, unresolved
- 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
- All outstanding exceptions shall be added to project punchlist

3 0 PRECAUTIONS AND LIMITATIONS

3 1 PERSONNEL SAFETY

3 1 1 Individuals shall carry out their assigned work in a safe manner to protect themselves, others, and the equipment from undue hazards and to prevent damage to property and environment

3 1 2 Test Director shall assure the safety of all activities within their areas to prevent injury, property damage, or interruption of operation

3 1 3 Any hazard identified during the performance of the procedure shall be reported to the Test Director IMMEDIATELY

3 1 4 A daily pre-job safety briefing will be held with all test participants and documented in the Pre-Job Safety form (JSA or Pre Job Safety form)

3 1 5 Performance of test activities shall always include safety and health aspects as delineated in the Operations Manuals and as directed by the Test Director

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3 2 RADIATION AND CONTAMINATION CONTROL

3 2 1 When performed without a work package, this procedure is limited to radiological areas and work activities permitted by a general radiation work permit

3 2 2 When work is performed in or when work will result in a high contamination, high radiation, or an airborne radioactive area, then an approved Job Control System work package must be developed which is reviewed by Radiological Control per the ALARA procedure HNF-IP-0842, Volume VII, Section 1 1

4 0 PREREQUISITES

4 1 SPECIAL TOOLS, EQUIPMENT, AND SUPPLIES

4 1 1 The following supplies shall be available at the test site

PROVIDED

- Ultrasonic Interface Level Analyzer Assembly
- Operator personal computer and Monitor
- Computer Cable from personal computer to Analyzer
- Software program

PROCURED

- Signal cable (temporary) from terminal box to transceiver, length as required
- Terminal box, reference Figure 1
- Test tank, minimum length 6 feet

To Be Supplied by Test Facility

- Miscellaneous items for Ultrasonic Interface Level Analyzer assembly set up and electrical/instrument connections

4 2 PERFORMANCE DOCUMENTS

The following procedures may be needed to perform this procedure

- Vendor Information manuals

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4 3 CONDITIONS AND ACTIONS

The following conditions must be met before this Acceptance Test Procedure (ATP) may commence

NOTE- All signators on this procedure shall document their signature on Procedure Signature Sheet

4 3 1 All field testing and inspection of the system or portions of the system to be tested has been completed

Daniel M Stenkamp — 12/17/99
Test Engineer Signature — Date

Daniel M Stenkamp
Test Engineer Print Name

4 3 2 A pre-job briefing has been held, and all participants have been thoroughly briefed on job safety, hazards, and their responsibilities before performing this Acceptance Test Procedure

JE Andrews — 12/17/99
Test Director Signature — Date

JE Andrews
Test Director Print Name

4 3 3 Test Director **VERIFY** Section 4 0 has been COMPLETED by SIGNING below

JE Andrews — 12/17/99
Test Director Signature — Date

JE Andrews
Test Director Print Name

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5 0 PROCEDURE

NOTE - This procedure shall be performed for each of the three Ultrasonic Interface Level Analyzer instrument assemblies This Procedure may be copied for use for each Ultrasonic Interface Level Analyzer assembly

5 1 Test Set Up

✓ 5 1 1 **RECORD** the unique Ultrasonic Interface Level Analyzer assembly number below

Assembly No WST-LY-705 (Riser 13A)

5 1 2 **ASSEMBLE** test equipment as follows (See figure 1)

✓ 5 1 2 1 **INSTALL** Ultrasonic Interface Level Analyzer assembly and test tank at test location

✓ 5 1 2 2 **ENSURE** power source to analyzer is on

✓ 5 1 2 3 **ENSURE** signal cable wires from temporary terminal box to transceiver are connected per Figure 1

✓ 5 1 2 4 **ENSURE** computer cable from analyzer to personal computer is connected

✓ 5 1 2 5 **ENSURE** the Royce Tank Profile software program has been installed on the personal computer

NOTE - In the following step a minimum of 6 feet of liquid SHALL be between the sensor and the test container wall The entire sensor SHALL be submerged A temporary wall may be inserted to determine the accuracy of distance readings

✓ 5 1 2 6 **ENSURE** tank is filled with water

✓ 5 1 2 7 **VERIFY** by signing below test set-up, section 5 1 has been completed

Paul A Werner — 12-17-99
QC Signature — Date

Paul A Werner
QC Print Name

J E Andrews — 12/17/99
Test Director Signature — Date

JE Andrews
Test Director Print Name

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5 2 Ultrasonic Interface Level Analyzer CONFIGURATION AND TESTING

NOTE- The following settings are required to be made in the Ultrasonic Interface Level Analyzer enclosure for correct operation

NOTE - When the unit is turned on for the first time, it will be in the alarm condition A message will appear on the graphic panel that explains that the unit will not operate until the tank depth has been programmed (If the unit does not give this error message, it means a non-zero tank depth value has already been stored In this case, only the RUN light will light on the front panel)

_✓_ 5 2 1 **ENSURE** the power is "ON"

_✓_ 5 2 2 **PRESS** the "PGM" key to enter the analyzer "program" mode of operation The unit should display a HELP screen

NOTE - For purposes of testing the installation, temporary program parameters will be entered to allow verification of connections

_✓_ 5 2 3 **PRESS** the "NEXT PAGE" key to bring up the "DISPLAY FORMAT" help screen

_✓_ 5 2 4 **PUSH** the UP arrow key to select a value of 3 to display the depth of clear water in feet

_✓_ 5 2 5 **PRESS** the "NEXT PAGE" key again to bring up the "ECHO PROFILE UPDATE RATE" screen

_✓_ 5 2 6 **PUSH** the applicable arrow keys to select a value of 4 to have the Ultrasonic Interface Level Analyzer average a minutes worth of tank profiles

_✓_ 5 2 7 **PRESS** the NEXT PAGE key to bring up the "INTERFACE LEVEL AVERAGING CYCLES" screen

_✓_ 5 2 8 **PUSH** the applicable arrow keys to select a value of 5 to average 5 profile groups

_✓_ 5 2 9 **PRESS** the PREV PAGE key to scroll back to the "TANK DEPTH" screen

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5 2 Ultrasonic Interface Level Analyzer CONFIGURATION AND TESTING (Cont)

NOTE - For the purpose of this section "TANK DEPTH" refers to the distance between the sensor and the temporary wall of the test vessel The "Bottom" of the tank may be the temporary wall of the test vessel

✓ 5.2.10 **RECORD** the measured distance between the sensor and the temporary tank wall.

Measured distance 6 . 7 feet.

✓ 5 2 11 **ENTER** a ~~temporary~~ tank depth in the analyzer in feet that is at least two feet deeper than the ~~actual~~ temporary tank depth (length)

~~**RECORD the below**~~

~~Tank Depth _____ _____ feet~~

NOTE - After the following step, the display will go blank for a minute or so while the unit attempts to adjust transmitter power to the condition of the test tank After this delay, an "echo profile" graph will appear in the LCD display The numbers along the side of the graph indicate the depth in feet from the top of the tank At each depth, the magnitude of the graph indicates the strength of the echo energy that is returning from that spot on the tank At the very bottom of the graph, the unit will display a message to indicate the transmitter power (GAIN) that is being used to create this graph

✓ 5 2 12 **PRESS** the RUN key

NOTE - The graph should show an obvious bump other than the bump on the top The bump on the very top is ignored in the next step

✓ 5 2 13 **VERIFY** there is at least one obvious bump in the graph

JE Andrews 12/17/99
Test Director Signature Date

JE Andrews
Test Director Print Name

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5 2 Ultrasonic Interface Level Analyzer CONFIGURATION AND TESTING (Cont)

NOTE - In the next step the tank bottom should appear as a sharp peak in the graph at some reading above zero, depending on the value used in step 5 2 11

✓ 5 2 14 **EXAMINE** the graph to see if the position of the temporary tank bottom is apparent

✓ 5 2 15 **ENTER** the exact tank bottom position shown on the graph to the nearest tenth of a foot

Tank Bottom Position 6 9 feet

✓ 5 2 16 **CALCULATE** the accuracy of Ultrasonic Interface Level Analyzer measurement ~~value from 5 2 10 - 5 2 14 = _____ feet.~~ By comparing the measured distance of sensor to temporary bottom, and the distance shown on the analyzer.

✓ 5 2 17 **VERIFY** accuracy is within +/- 0 3 feet

JE Andrews 12/17/99
Test Director Signature Date

JE Andrews
Test Director Print Name

✓ 5 2 18 **RECORD** the transmitter power (Gain) used to create the graph 1%

✓ 5 2 19 **VERIFY** Gain is less than 5

JE Andrews 12/17/99
Test Director Signature Date

JE Andrews
Test Director Print Name

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5 2 Ultrasonic Interface Level Analyzer CONFIGURATION AND TESTING (Cont)

✓ 5 2 20 **VERIFY** that the graphical profile readings ~~and numerical sludge level~~ are displayed at the Ultrasonic Interface Level Analyzer personal computer monitor

J E Andrews — 12/17/99
Test Director Signature — Date

JE Andrews
Test Director Print Name

NOTE - The Test Sections of this procedure may be copied to perform the following step as many times as necessary

✓ 5 2 21 **REPEAT** testing sections per Test Director for each URSILLA sensing unit to be tested

✓ 5 2 22 **VERIFY** that Testing is COMPLETE by SIGNING below

Paul A Werner — 12-17-99
QC Signature — Date

Paul A Werner
QC Print Name

J E Andrews — 12/17/99
Test Director Signature — Date

JE Andrews
Test Director Print Name

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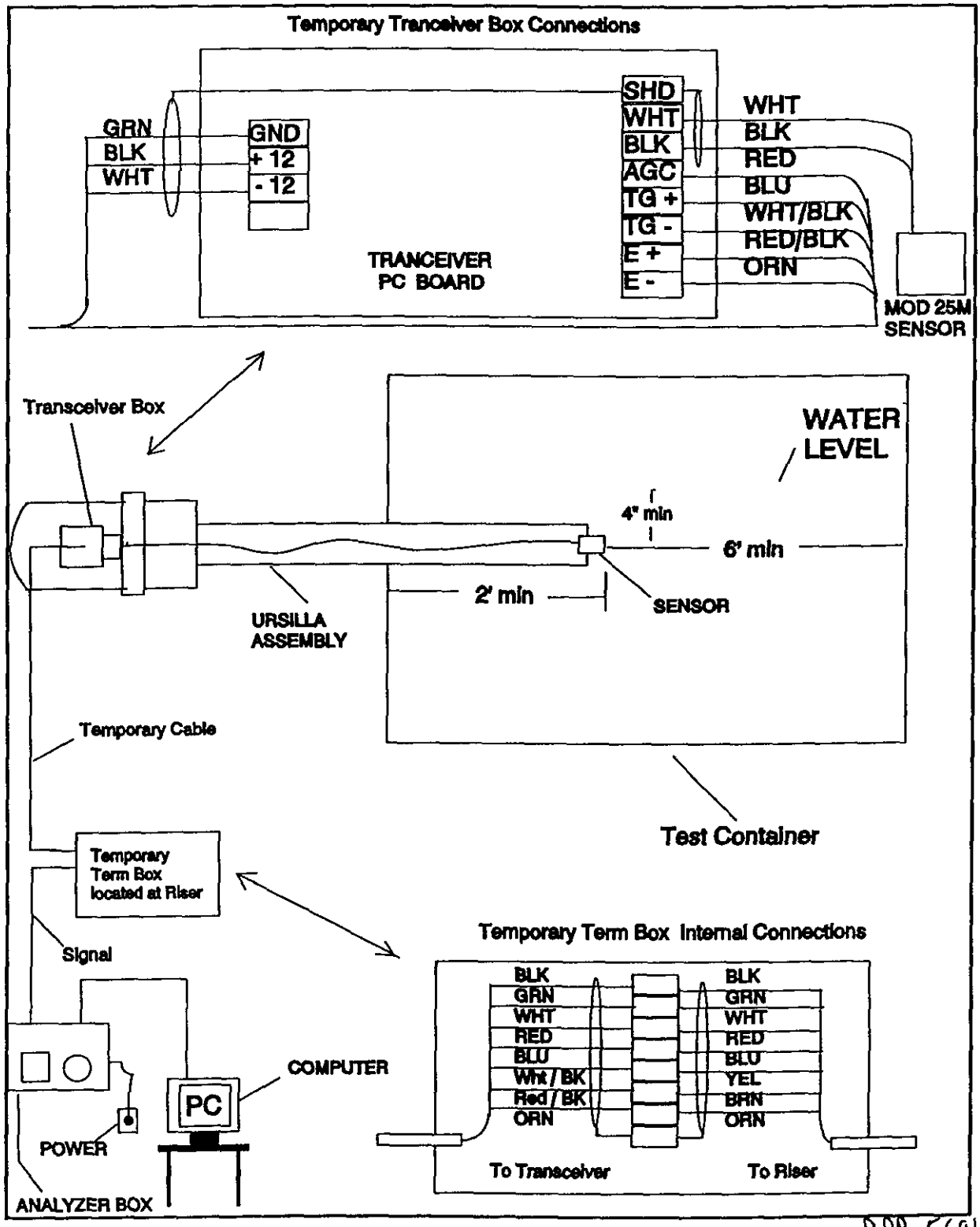
FIGURE 1



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ACCEPTANCE TEST PROCEDURE PERFORMANCE LOG

This page may be reproduced as necessary Page _____ of _____

ATP PERFORMANCE EVENT	DATE	INITIALS
Completed testing of WST-LV-705		
(Riser 13A) Analyzer and probe satisfactorily		
with "no" exceptions.	12/17/99	JG

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ACCEPTANCE TEST PROCEDURE EXCEPTION LOG

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Number	Date	Description

N/A JE Hedges 12/17/99

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ACCEPTANCE TEST PROCEDURE EXCEPTION RECORD

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ATP Step Number	ATP Exception Log#
Description of Exception	
Name / Organization Of Initiator	
Date of Exception	
Resolution of Exception	
Date of Resolution	
Test Director Signature	Date
Test Engineer Signature	Date
Quality Assurance Signature	Date

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PROCEDURE SIGNATURE SHEET

PRINT NAME	SIGNATURE	INITIALS
JE Andrews	JE Andrews	JEA
Dan Stenkamp	D M Stenkamp	DMS
Paul A Werner (QR)	Paul A Werner	PAW
R DyKeman	R DyKeman	RD
Gary R Turdiff	Gary Turdiff	GRT

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PROCEDURE HISTORY SIGNATURE SHEET

Last Full Revision A-0
Release Date 11/22/99
USQ Screening Number TF-99-0899 REV 0
Approval Designator SQ

Current Modification A-0
USQ Screening Number TF-99-0899 REV 0
Approval Designator SQ
PCA Incorporated N/A

POSITION/ORG	DELEGATE	DATE
Inst	James L. Williams	11/19/99
LNCO/OPS	S.R. Joseph	11/19/99
QAE/QA	Charles A.Sams	11/22/99
Shift Manager	J E Andrews	11/19/99
Safety	R.A. Huckfeldt	11/22/99
OTHER	P.C. Miller	11/22/99
RAD CON	Bob Brown	11/22/99
Cog Eng	Gary R Tardiff	11/19/99
Acceptance Review	David W.VanDyke	11/23/99
Approval Authority	David A Selle	11/23/99

Justification New equipment pre installation testing

Summary of Changes New Procedure

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Last Full Revision A-0
Release Date 11/22/99
USQ Screening Number TF-99-0899 REV 0
Approval Designator SQ

Current Modification A-1
USQ Screening Number TF-98-1201 REV 1
Approval Designator N/A
PCA Incorporated ETF-99-747

POSITION/ORG	DELEGATE	DATE
LNCO/OPS	E.R. Caraway	12/16/99
Shift Manager	J.E. Andrews	12/16/99
Cog Eng	Dan Reberger	12/16/99
Acceptance Review	David W.VanDyke	12/16/99
Approval Authority	J.E Andrews	12/16/99

Justification Ops Request

Summary of Changes Word Changes on Page 17 & 18

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