<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;"> <p>STA 4 AUG 31 1994</p> </div> <div> <p>ENGINEERING DATA TRANSMITTAL</p> </div> </div>	<p>Page 1 of <u>1</u></p> <p>1. EDT 601304</p>
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<p>2. To: (Receiving Organization) TWR/WTO</p>	<p>3. From: (Originating Organization) TWR/WTPE/Surveillance Systems Engineering</p>	<p>4. Related EDT No.: N/A</p>
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(G)	(H)	17. SIGNATURE/DISTRIBUTION (See Approval Designator for required signatures)								(G)	(H)
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1	1	Cog.Eng. R.H. Webb N1-46	<i>[Signature]</i>	8/31/94		W. G. Brown S2-45				3	
1	/	Cog. Mgr. D. B. Smet N1-46	<i>[Signature]</i>	8/31/94		T. A. Delucchi L6-38				3	
		QA				R. C. Cecil N1-46				3	
		Safety				Central Files Orig + 2 Copies L8-04					
		Env.				OSTI 2 Copies L8-04 L8-07					
1		Operations D. Scott Jr. T4-01	<i>[Signature]</i>								
3		R. R. Stickney R1-49									

<p>18. <i>[Signature]</i> 8/31/94 Signature of EDT Originator Date</p>	<p>19. _____ Authorized Representative Date for Receiving Organization</p>	<p>20. <i>[Signature]</i> 8/31/94 Cognizant Manager Date</p>	<p>21. DOE APPROVAL (if required) Ctrl. No. ☐ Approved ☐ Approved w/comments ☐ Disapproved w/comments</p>
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RELEASE AUTHORIZATION

Document Number: WHC-SD-WM-TPI-017

Document Title: INSTRUCTIONS FOR 104-SX LIQUID LEVEL MEASUREMENT
FIELD TESTS

Release Date: 08/31/94

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

APPROVED FOR PUBLIC RELEASE

* * * * *

WHC Information Release Administration Specialist:

Jamara Kohn for Chris Willingham

C. Willingham

(Signature)

08/31/94

(Date)

SUPPORTING DOCUMENT		1. Total Pages 8
2. Title INSTRUCTIONS FOR 104-SX LIQUID LEVEL MEASUREMENT FIELD TESTS		3. Number WHC-SD-WM-TPI-017
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5. Key Words Liquid Level Measurement probe liner sleeve Liquid Observation Well		6. Author Name: R. H. Webb <i>R. H. Webb</i> Signature Organization/Charge Code 7CF80/N173D
<p style="text-align: center;">APPROVED FOR PUBLIC RELEASE <small>(U) 8/31/94</small></p>		
7. Abstract This document provides detailed instructions for field testing a suggested solution of inserting a liner inside the 104-SX failed Liquid Observation Well to gain access for making temporary Liquid Level Measurement until a permanent solution has been provided.		
8. PURPOSE AND USE OF DOCUMENT - This document was prepared for use within the U.S. Department of Energy and its contractors. It is to be used only to perform, direct, or integrate work under U.S. Department of Energy contracts. This document is not approved for public release until reviewed. PATENT STATUS - This document copy, since it is transmitted in advance of patent clearance, is made available in confidence solely for use in performance of work under contracts with the U.S. Department of Energy. This document is not to be published nor its contents otherwise disseminated or used for purposes other than specified above before patent approval for such release or use has been secured, upon request, from the Patent Counsel, U.S. Department of Energy Field Office, Richland, WA. DISCLAIMER - This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, nor any of their contractors, subcontractors or their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or any third party's use or the results of such use of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof or its contractors or subcontractors. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.		10. RELEASE STAMP <div style="border: 1px solid black; padding: 5px; text-align: center;"> OFFICIAL RELEASE (13) BY WHC DATE AUG 31 1994 <i>SA 4</i> </div>
9. Approval Designator Impact Level 4 N/A		

INSTRUCTIONS FOR 104-SX LIQUID LEVEL MEASUREMENT FIELD TESTS

1.0 GENERAL DESCRIPTION

Washington State law requires the liquid levels of the waste in all of the Hanford radioactive waste tanks to be measured at regular intervals. The measurement process that is used consists of using a custom-made neutron probe and lowering it down into a 4" dry well called a Liquid Observation Well (LOW). This probe is used to determine where the surface of the waste is located with respect to height in the tank.

Both 4" LOWs, used for taking interstitial liquid level (ILL) measurements in the 104-SX Tank at 200 WEST, have failed and ILL measurements have not been taken in over 2 years. Surveillance Systems Engineering has recommended a temporary solution for gathering the necessary ILL data by using a combination of a durable LOW liner and neutron probe sleeve.

Both PVC and polyurethane LOW liners and probe sleeves have been procured to determine the which material will work the best. Two field tests will be performed:

- 1) Field Test 1, Liner/Sleeve Deployment and Withdrawal, at the 306 building test well facility.
- 2) Field Test 2, Liner Durability with ILL Measurement Simulation, at the 272-WA facility.

2.0 PURPOSE AND SCOPE

2.1 PURPOSE

The purpose of these instructions is to document the field tests that are to be performed to verify the applicability of using a LOW lining and probe sleeve to gain temporary ILL measurements in one of the 104-SX failed LOWs. Results from the field test will identify the viability of using a LOW liner/Probe sleeve setup to assist in gathering temporary ILL measurements. In addition, the results from the tests will provide a recommendation as to which material liner and sleeving (PVC or polyurethane) to use.

2.2 SCOPE

The scope of this test will be to verify the viability of using a LOW liner/Probe sleeve setup through Field Tests 1 and 2 as stated below.

NOTE: The scope of this test DOES NOT cover field installation or removal of the ILL measurement equipment at the 104-SX tank itself. Field test results will be provided to Waste Tank Plant Engineering (WTPE) and Waste Tank Operations (WTO) for their use in actual field work.

3.0 TEST CONDITION LIMITS

- 3.1** Either Field Tests 1 or 2 can be stopped at any time if any personnel safety hazards are perceived. If this happens, the testing will be stopped and the field test will be secured in a safe condition. The perceived safety hazard will then be reviewed and appropriate action will be taken prior to restart of the test.
- 3.2** A pre-job safety meeting will be performed prior to each of the actual tests and documented on a pre-job safety meeting form.

4.0 ORGANIZATION AND FUNCTION RESPONSIBILITIES

4.1 Surveillance Systems Engineering (SSE):

- Procure/provide the necessary equipment and material for the both field tests
- Provide instructions for both of the field tests
- Schedule an appropriate facility Field Test 1 (Liner/Sleeve Deployment and Withdrawal Test) and arrange for any other necessary support (PIC, work package, etc.)
- Make necessary arrangements with WTO for 272-WA facility use for Field Test 2 (Sleeve Durability with ILL Measurement Simulation)
- Provide necessary personnel for actual field tests
- Document field test results with appropriate reports or video tape
- Make any necessary arrangements for final material disposition
- Remain as technical contact

4.2 Waste Tank Operations:

- Be available to observe Field Test 1
- Provide probe or suitable simulated housing for both field tests. **NOTE:** Probe should be clean.

- Provide the 272-WA facility for Field Test 2 (Sleeve Durability with ILL Measurement Simulation)

- Provide necessary personnel and equipment support to work Field Test 2. **NOTE:** WTO will be in charge of their measurement equipment and work hand-in-hand with SSE personnel.

4.3 Waste Tank Plant Engineering:

- As cognizant engineer of 104-SX LOWs, provide any necessary consultation

- Be available to observe either/both field tests

4.4 306 Building Personnel:

- Provide necessary personnel support to assist/assemble the test equipment as required

- If necessary, provide for a facility-specific trained Person-in-Charge

- Assist SSE personnel as required

5.0 FACILITIES AND EQUIPMENT

5.1 FACILITIES

5.1.1 Field Test 1, Liner/Sleeve Deployment and Withdrawal, will be performed at the 306E building test well facility. **NOTE:** A "306 Building Statement of Work" will be completed prior to the Field Test 1.

5.1.2 Field Test 2, Liner Durability with ILL Measurement Simulation, will be performed at the 272-WA facility.

5.2 EQUIPMENT

5.2.1 Stage the following equipment for Field Test 1:

- 3" Clear PVC pipe, flanges, nuts & bolts, and bottom end cup and any necessary equipment required for assembling including mounting apparatus

- PVC and polyurethane liners/sleeves

- Handy-Cam with charged batteries and blank video tapes

- Liner deployment weight

- Miscellaneous tools that might be needed, including Duck tape and leather gloves
- Probe or simulated probe housing and deployment rope to lower the housing or simulated probe.
- SSE logbook

5.2.2 Stage the following equipment for Field Test 2:

- 3" Regular PVC pipe, flanges, nuts & bolts and necessary assembling equipment
- PVC and polyurethane liners/sleeves
- Liner deployment weight
- Probe housing and associated test well measurement truck/equipment
- CCTV camera with light ring and necessary controller equipment and/or VCR and blank video tapes
- Miscellaneous tools that might be needed, including Duck tape
- SSE Logbook

6.0 SAFETY

- 6.1 A pre-job safety briefing is to be performed with all parties participating in each of the Field Tests.
- 6.2 Personnel that are required to enter the 306E building test well pit are to review the confined entry permit and any site specific requirements.
- 6.3 Hard hats are required in Field Test 1 for personnel requiring access into test well pit.
- 6.4 Leather gloves are suggested in deploying/withdrawing the probe in Field Test 1, instruction step 8.1.6.
- 6.5 All work shall be performed in accordance with WHC-CM-4-3, Industrial Safety Manual.

7.0 TEST DATA

Test data will be recorded on video tape. Any further data that is deemed necessary will be recorded in an SSE log book.

8.0 PERSONNEL REQUIREMENTS

Personnel that will be accessing the 306E test well pit in Field Test 1 are required to have current Confined Space Entry training.

9.0 WITNESSES

As stated in Section 3 of this document, Personnel from TWR/WTO is requested to be present. It is optional for personnel from TWR/WTPE to be present.

10.0 TEST INSTRUCTIONS

10.1 FIELD TEST 1, LINING/SLEEVE DEPLOYMENT AND WITHDRAWAL TEST

- 10.1.1 Assemble simulated LOW with clear PVC pipe per SSE Engineer's instructions.

*****CAUTION*****

Hard hats must be worn in by personnel in the test well pit.

- 10.1.2 Prepare Handy-Cam in necessary configuration to record the sleeve being deployed in the simulated LOW.
- 10.1.3 Prepare probe housing in PVC sleeve and secure to lowering rope.
- 10.1.4 Prepare LOW PVC liner per SSE Engineer's instructions with liner deployment weight.
- 10.1.5 Carefully lower the PVC liner into the simulated LOW while video taping from below with the Handy-Cam until the liner is fully deployed. Secure liner at top on flange with Duck tape and plastic flange per SSE Engineer's instructions.

*****CAUTION*****

Manual deployment of probe may require gloves for personnel safety.

- 10.1.6 Carefully lower the sleeved probe down into the lined LOW while video taping probe deployment.

NOTE: The speed of probe deployment is not important for this step because the capability of probe deployment is the main concern here. Field Test 2 will address probe deployment at typical speeds. SSE personnel will take notes on test as necessary.

- 10.1.7 Once the probe has been deployed, withdraw the probe per SSE Engineer's instructions and video tape probe withdrawal.

- 10.1.8 Arrange for a bend in the simulated LOW per SSE Engineer's instructions. This bend should simulate as best as possible the 104-SX failed/bent LOW.

- 10.1.9 Repeat steps 10.1.6 through 10.1.7 to deploy/withdraw probe.

- 10.1.10 Carefully withdraw PVC liner by hand and video tape withdrawal of the liner.

- 10.1.11 Repeat steps 10.1.3 through 10.1.10 utilizing the polyurethane liner and sleeve.

- 10.1.12 Liner/sleeve material recommendations will be made as a result of this test.

- 10.1.13 Disassemble test equipment as necessary and leave facility in a safe condition.

10.2.0 FIELD TEST 2, LINER DURABILITY With ILL MEASUREMENT SIMULATION

NOTE: Liner/sleeve material will be recommended from Field Test 1, instruction step 10.1.12.

- 10.2.1 Assemble simulated LOW with 3" PVC pipe and flange configuration per SSE Engineer's instructions.

- 10.2.2 Configure CCTV camera system per SSE Engineer's instructions as required.

- 10.2.3 Prepare probe in sleeve and secure sleeving at controller cable/deployment wire interface. WTO ILL measurement equipment should be completely functional for this test.

10.2.4 Prepare LOW liner per SSE Engineer's instruction with liner deployment weight.

10.2.5 Carefully lower the liner into the simulated LOW. Secure the liner per SSE Engineer's instructions once liner is fully deployed.

*****CAUTION*****

LOW liner is only 43 feet long. The probe shall not be lowered more than 40 feet at any point in time.

10.2.6 Proceed with deployment of the probe into the simulated LOW per standard WTO procedures. NOTE: This is to ensure the proper deployment speed. In addition, if deemed feasible at the time, follow the probe down into the simulated LOW with a CCTV camera and record the probe deployment from above (This will document any rips or tears in the liner that are created by probe deployment as well as show their associated cause).

NOTE: Should the follow-up of the probe with the CCTV camera not be feasible, SSE Engineer's shall provide another inspection device or the liner can be visually inspected upon removal.

10.2.7 Once the probe has been deployed to 40', remove the CCTV camera and then withdraw the probe per standard WTO procedures.

10.2.8 Steps 10.2.2 through 10.2.7 should be repeated as many times as requested by SSE Engineer/WTO personnel.

10.2.9 Disassemble test equipment as necessary and leave facility in a safe condition.

11.0 DATA SHEETS

The video tapes shall suffice as data sheets. Any further data that is deemed necessary will be recorded in an SSE log book.

12.0 REPORT

A report that documents field test results shall be issued to the TWR/WTO identifying areas of interest. This report is to be in the format recommended in WHC-IP-1026, Engineering Practice Guidelines, Appendix K Rev. 0 (Test Plans, Specifications, Procedures, and Reports).