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Acceptance Test Procedure, 241-SY-101 Flexible Receiver System, Phase I Testing		ECN No. NA

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2. To: (Receiving Organization) See Distribution List	3. From: (Originating Organization) Nuclear Analysis and Characterization	4. Related EDT No.: NA
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11. Receiver Remarks:		10. System/Bldg./Facility: 241-SY-101
		12. Major Assm. Dwg. No.: NA
		13. Permit/Permit Application No.: NA
		14. Required Response Date: ASAP

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16. KEY		
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1	1	Cog. Mgr.	CE Hanson	1/27/95	H5-09						
1	1	QA	ML McElroy	1/27/95	S1-57						
1	1	Safety	LS Krogsrud	1/27/95	R3-08						
		Env.									
		Proj/Prog.									
1	1	Other	MJ Ostrom	1/27/95	H5-68						

18. Signature of EDT Originator G. A. Ritter 1/23/95	19. Authorized Representative for Receiving Organization C. E. Hanson 2/16/95	20. Engineer's Manager H. Toffer 1/27/95	21. DOE APPROVAL (if required) Ltr. No. <input type="checkbox"/> Approved <input type="checkbox"/> Approved w/comments <input type="checkbox"/> Disapproved w/comments
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Release Date: 2/06/95

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

APPROVED FOR PUBLIC RELEASE

WHC Information Release Administration Specialist:

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Acceptance Test Report, 241-SY-101 Flexible Receiver System, Phase I Testing

3. Number

WHC-SD-WM-ATR-091

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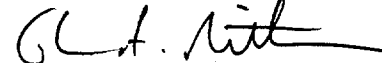
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5. Key Words

Phase I
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retrieval system
241-SY-101
leak test
flexible receiver

6. Author

Name: G. A. Ritter



Signature

Organization/Charge Code 8D520/N2B2K

7. Abstract

This report summarizes the results of the leak testing of the 241-SY-101 Flexible Receiver System Containment Bag performed at the bag manufacturer's facility. This acceptance test verified the sealing integrity of the containment bag to ensure that release of waste and aerosols will be minimized during the removal of the test mixer pump from tank SY-101.

8. RELEASE STAMP

OFFICIAL RELEASE 38
BY WHC
DATE FEB 06 1995
Sta. 21

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**ACCEPTANCE TEST REPORT
241-SY-101 FLEXIBLE RECEIVER SYSTEM
PHASE I TESTING**

1.0 INTRODUCTION

This document summarizes the results of the phase I acceptance test of the 241-SY-101 Flexible Receiver System (FRS). This acceptance test consisted of a pressure-decay/leak test of the containment bag to verify that the seams along the length of the bag had been adequately sealed. The sealing integrity of the FRS must be verified to ensure that the release of waste and aerosols will be minimized during the removal of the test mixer pump from Tank 241-SY-101. The FRS is one of six major components of the Equipment Removal System, which has been designed to retrieve, transport, and store the mixer pump. This test encompasses test requirements for the Phase I test as defined in WHC-SD-WM-TP-257, *Test Plan for Qualification Testing of the 241-SY-101 Flexible Receiver System*.

This acceptance test was performed at Lancs Industries in Kirkland, Washington on January 17, 1995. The test was witnessed by a WHC Quality Assurance representative and the FRS cognizant engineer. Funding for this test was provided by the 101-SY Hydrogen Mitigation Program.

2.0 DESCRIPTION OF TEST

This acceptance test consisted of a pressure-decay/leak test of the containment bag during the fabrication phase to demonstrate that the seams along the length of the bag have been adequately sealed. The acceptance criteria for the test is that the bag pressure shall remain above 75% of the initial pressure of 2,500 Pa (10 inches H₂O) for 1 hour.

To prepare the bag for the leak test, the ends of the bag were fabricated approximately 0.6 m (2 feet) longer than the final bag length. Long metal bars were used to roll up the ends of the bag and clamps were attached to secure the metal bars in place and form a seal. A calibrated pressure gage was connected to an inflation/deflation valve on one end of the bag and the bag was inflated to 2,500 Pa (10 inches H₂O). A calibrated thermometer was then attached to the center of the bag and the pressure inside the bag was allowed to stabilize for 3 - 4 hours.

The initial time, pressure and temperature were recorded and the inflated bag was allowed to sit for 1 hour. At the end of 1 hour, the pressure and temperature were recorded and the results were evaluated using a temperature compensation factor of +/- 200 Pa (0.8 inches H₂O) for every 0.6 °C (1 °F) of temperature gain/loss. The test procedure given in Appendix A describes the test in more detail. Appendix B contains the certificates of calibration for the manometer and thermometer used for this acceptance test. Following the test, the bag ends were cut to the specified length and the bag fabrication was completed.

MASTER

3.0 TEST RESULTS

The test results, taken from Appendix C, are summarized in the table below. The uncertainties on the pressure and temperature measurements are $\pm 1\%$ and $\pm 0.15\text{ }^{\circ}\text{C}$ ($\pm 0.25\text{ }^{\circ}\text{F}$), respectively. The bag pressure loss was 375 Pa (1.5 inches H₂O) without temperature compensation. Subtracting 200 Pa (0.8 inches H₂O) for the 0.6 °C (1 °F) temperature increase, the pressure loss was 575 Pa (2.3 inches H₂O).

	Time	Pressure Reading Pa (inches H ₂ O)	Temperature °C (°F)
Initial	10:35 a.m.	2375 (9.5)	12.8 (55)
Final	11:35 a.m.	2000 (8.0)	13.3 (56)

4.0 CONCLUSIONS

The bag temperature-compensated pressure loss of 575 Pa (2.3 inches H₂O) was below the acceptance criteria of 625 Pa (2.5 inches H₂O) and the test results were therefore found to be acceptable. The bag manufacturer estimates that 80 - 90% of the pressure loss is attributed to leakage around the bag inflation valve where the pressure gage was connected. A leak detector was applied over the entire bag during the pre-tests and no leakage was found. Furthermore, the leak rate corresponding to this pressure loss is very small when compared to the acceptable leak rate of the completely assembled FRS. The sealing integrity of the assembled FRS is verified in phase III testing.

5.0 REFERENCES

- WHC, 1994, *Test Plan for Qualification Testing of the 241-SY-101 Flexible Receiver System*, WHC-SD-WM-TP-257, Westinghouse Hanford Company, Richland, Washington.
- WHC, 1995a, *Flexible Receiver Drawing Tree*, drawing H-2-821385, Rev. 0, Draft, Westinghouse Hanford Company, Richland, Washington.
- WHC, 1995b, *Flexible Receiver Bag Assembly*, drawing H-2-821391, Rev. 0, Draft, Westinghouse Hanford Company, Richland, Washington.

APPENDIX A - SUPPLIER ACCEPTANCE TEST PROCEDURE



P.O. #WM1-XVV-417302
DWG #H-2-821391 REV 0

CALIBRATED INSTRUMENTS:

- | | |
|----------------|--|
| 1. THERMOMETER | MFR TAYLOR / MODEL 6071-1 / SERIAL #KGB61494A |
| 2. MANOMETER | MFR AMETER / MODEL G 22704 / SERIAL #KGB122194 |

PRETEST BAG:

1. ATTACH CALIBRATED MANOMETER AND INFLATE BAG TO 10" H₂O.
2. APPLY LEAK DETECTOR TO ALL SEAMS & TIE-PATCHES AND INSPECT ENTIRE BAG FOR LEAKS.
3. REPAIR ANY LEAKS WITH A CLOUED OR HEAT SEALED PATCH.
4. REINFLATE TO 10" H₂O AND RETEST ALL REPAIRS.

FINAL TEST BAG:

1. REATTACH CALIBRATED MANOMETER AND INFLATE BAG TO 10" H₂O.
2. ATTACH CALIBRATED THERMOMETER TO CENTER SIDE OF BAG. ALLOW PRESSURE IN BAG TO STABILIZE. (3-4 HOURS)
3. REGULATE PRESSURE TO 10" H₂O, RECORD TEMPERATURE, DATE AND TIME ON BAG PER DWG, AND BEGIN TEST.
4. ALLOW BAG TO SIT FOR 1 HOUR. RECHECK AND RECORD PRESSURE, TIME AND TEMPERATURE ON BAG.
5. EVALUATE END RESULTS USING TEMPERATURE COMPENSATION FACTOR OF +.8" WATER FOR EVERY 1°F OF TEMPERATURE GAIN AND -.8" WATER FOR EVERY DEGREE OF TEMPERATURE LOSS.
6. IF AFTER COMPENSATING FOR CHANGE IN TEMPERATURE THE NET LOSS OF PRESSURE DOES NOT EXCEED 2.5" H₂O, THE BAG HAS PASSED. RECORD ALL RESULTS AND COMPLETE TEST REPORT.
7. IF AFTER COMPENSATING FOR CHANGE IN TEMPERATURE, THE NET LOSS OF PRESSURE EXCEEDS 2.5" H₂O, REINFLATE BAG TO 10" H₂O, APPLY LEAK DETECTOR TO IDENTIFY ANY LEAKS AND CONSULT WITH THE Q.C. SUPERVISOR AS TO HOW TO AFFECT PATCHING THE BAG OR IN THE EVENT OF A CATASTROPHIC FAILURE, WHETHER TO ATTEMPT TO REWORK OR MERELY SCRAP THE BAG.
8. IN THE EVENT A BAG FAILS THE FINAL TEST AND REQUIRES REWORKING, THE NATURE OF THE FAILURE AND REWORK ARE TO BE REFLECTED ON THE TEST REPORT AS WELL AS THE RESULTS OF THE RETEST.

NOTE: HEAT SEALED PATCHES USING 8-12 MIL CLEAR OR WHITE PVC OR WHITE HERCULITE OF THE SAME TYPE AS THE BAG IS PREFERRED, BUT IF NECESSARY, VINYL CEMENT BY RH PRODUCTS TYPE HH-66 MAY BE USED AT THE DISCRETION OF THE Q.C. SUPERVISOR TO ADHERE PATCHES.

PLANT:
12704 NE 12th Street, Kirkland, WA 98034 8307
206/823-6634 FAX 206/820-6184

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3890 Post Rd., Suite 6, Warwick, RI 02886
401/828 0302 FAX 401/864-2341

APPENDIX B - CERTIFICATES OF CALIBRATION FOR INSTRUMENTATION

Branom Instrument Co.

Manufacturers' Representatives
& Master Distributors
SINCE 1947



1-800-767-6051

Certificate of Calibration

TO: Lanco

DATE OF CALIBRATION: 12-21-94

RECALL DUE IN 12 MONTHS

MODEL NO. G22704

SERIAL NO. KGB122194

This is to certify the above listed instrument meets or exceeds all published specifications and has been calibrated using standards whose accuracies are traceable to the National Institute of Standards and Technology.

Applicable NIST test report numbers are as follows:

STANDARDS USED IN CALIBRATION:

MODEL Ametek

SERIAL #

75585

DUE DATE 9-95

CAL PROCEDURE: To mfg specs $\pm 1\%$ full scale

IN CAL AS RECEIVED:

The tests were conducted at:

a temperature of 73°F and a relative humidity of 41%

Date December 21, 1994 Certified By:

Lance Moxell

P.O. No. 8134

Q.A. Manager Troy Perkins



MANOMETER
0-30" H₂O

Branom Instrument Co.

Manufacturers' Representatives
& Master Distributors
SINCE 1947



1-800-767-6051

- For TIME
- TEMPERATURE
- PRESSURE
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1-800-534-9795 or 9796
FAX 1-509-634-9397

ALASKA
FROM ALASKA CALL:
1-800-554-8205
FAX 1-206-767-5869

BRITISH COLUMBIA

INSTRUMENT CALIBRATION REPORT

Certification of Accuracy

Date June 14, 1994

Purchase Order # 7807

Customer Name LANKS LANKS (LR) Address _____

Instrument Make Taylor Model 6071-1 Serial Number KGB61494A

Calibration Standard Taylor Therms Serial Number _____

STANDARD	INSTRUMENT READING	STANDARD	INSTRUMENT READING
32°F	32°F		
95°F	95°F		

Remarks: All tests have been performed in accordance with all applicable requirements of MIL-9858A, MIL-4520RA and MIL-STD-45662A with test equipment certified in standards traceable to the National Bureau of Standards. The tested instrument is certified to be accurate within manufacturer's specifications.

Comments _____

LAB Temperature 74°F
LAB Humidity 45%
Recertification Due June 14, 1995

Lance Mertell
Signature, Test Technician
Lance Mertell

APPENDIX C - SUPPLIER ACCEPTANCE TEST REPORT



TEST REPORT

PURCHASE ORDER # WMH-XVV-417302
 DRAWING # H-2-821391 REV 0 SHTS 1-5 PART # 2
 SERIAL # 1 A
 DATE OF TEST 1/17/95
 START TIME 10:35 AM STOP TIME 11:35 AM

	START	STOP	LOSS/GAIN
AIR PRESSURE H ₂ O"	9.5" H ₂ O	8.0" H ₂ O	LOSS 1.5"
TEMPERATURE	55°F	56°F	GAIN 1°

NOTE: DEPENDING ON WHETHER THE TEMPERATURE HAS LOST/GAINED, USE THE FOLLOWING FORMULA TO DETERMINE THE FINAL PRESSURE.

CONVERSION FORMULA:

PRESSURE LOSS/GAIN - (TEMP. GAIN X .8) = ADJUSTED PRESSURE LOSS/GAIN
LOSS 1.5 - (GAIN 1° X .8) = 2.3° H₂O LOSS

PRESSURE LOSS/GAIN + (TEMP. LOSS X .8) = ADJUSTED PRESSURE LOSS/GAIN
 _____ + (_____ X .8) = _____

IF THE BAG HAS LOST LESS THAN 2.5" H₂O IT HAS PASSED.

TESTED BY K. R. [Signature] DATE 1/17/95

WITNESSED BY [Signature] DATE 1/17/95

Q. A. [Signature] 1/17/95

IN THE EVENT THE BAG HAS LOST MORE THAN 2.5" H₂O IT HAS FAILED. NOTIFY Q.C. SUPERVISOR FOR DISPOSITION OF ANY FAILED BAG. THE FOLLOWING IS TO BE COMPLETED BY THE Q.C. SUPERVISOR DETAILING THE FINDINGS AS TO THE CAUSE, SEVERITY AND REPAIR OF THE FAILURE. ATTACH A SUPPLEMENTAL TEST REPORT FOR THE RETESTING.

* 1 MAJOR PATCH WHERE REINFORCEMENT PATCH IS SEALED IN. HEAT SEALED REPAIR.

* APPROXIMATELY 1/2 DOZEN SMALL PINHOLES GLUE PATCHED.

* MOST OF PRESSURE LOSS IS ATTRIBUTABLE TO LEAK AROUND INFLATION SLEEVE WHICH IS NOT PART OF BAG AND WHICH WILL BE CUT OFF AFTER TEST.

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 12704 NE 124th Street, Kirkland, WA 98034 8397
 206/823 6634 FAX 206/820 6784

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 401/828-9392 FAX 401/884 2341

APPENDIX D - SUPPLIER CERTIFICATE OF COMPLIANCE

