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		Date 06/01/95
Project Title/Work Order WHC-SD-WM-ATR-127, Rev. 0 Acceptance Test Report for The Ultra High Pressure Bore Head for Use in the Self-Installing Liquid Observation Well		EDT No. 611335
		ECN No. N/A

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1	WHC-SD-WM-ATR-127	A11	0	Acceptance Test Report Procedure For The Ultra High Pressure Bore Head for Use in The Self-Installing Liquid Observation Well		\$10	1	1

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BD-7400-172-2 (04/94) GEF097

RELEASE AUTHORIZATION

Document Number: WHC-SD-WM-ATR-127, Rev. 0

Document Title: Acceptance Test Report for the Ultra High Pressure
Bore Head for Use in the Self-Installing Liquid
Observation Well

Release Date: 6/14/95

**This document was reviewed following the
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SUPPORTING DOCUMENT

1. Total Pages 7

2. Title

ACCEPTANCE TEST REPORT FOR THE ULTRA HIGH PRESSURE
BORE HEAD FOR USE IN THE SELF-INSTALLING LIQUID
OBSERVATION WELL

3. Number

WHC-SD-WM-ATR-127

4. Rev No.

0

5. Key Words

Acceptance Test Report, ATR, Ultra High Pressure
Bore Head, Liquid Observation Well, LOW

6. Author

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Organization/Charge Code 75220/N2C44

7. Abstract

In order to monitor and characterize waste stored in single-shell tanks, liquid observation wells (LOWs) have been installed to permit periodic insertion of instrumentation probes to evaluate the waste's cross-sections characteristics.

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8. RELEASE STAMP

OFFICIAL RELEASE
BY WHC
DATE JUN 14 1995
35 Station 21

WHC-SD-WM-ATR-127

REV. 0

ACCEPTANCE TEST REPORT
FOR
THE ULTRA HIGH PRESSURE BORE HEAD FOR USE IN
THE
SELF-INSTALLING LIQUID OBSERVATION WELL

June 1995

Author

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**ACCEPTANCE TEST PROCEDURE FOR THE
ULTRA HIGH PRESSURE BORE HEAD FOR USE IN
THE SELF-INSTALLING LIQUID OBSERVATION WELL**

1.0 INTRODUCTION

In order to monitor and characterize waste stored in single-shell tanks, liquid observation wells (LOWs) have been installed to permit periodic insertion of instrumentation probes to evaluate the waste's cross-sections characteristics. Previously, installation required sluicing a 5" to 6" diameter hole with a water lance, and then inserting the LOW in the hole. This method has two major problems:

- Sluicing uses 200 gallons to 1,500 gallons of water (new waste).
- It is difficult, and sometimes impossible, to find the sluiced hole with the LOW.

An ultra high pressure water bore head has been developed for use with the thermocouple trees and the instrumentation probes that is an integral part of these probes and uses very little water. This bore head eliminates both of the above-mentioned problems.

Westinghouse Hanford Company contracted with the supplier of the ultra high pressure bore head, Quest Integrated, to modify the Quest Integrated bore head design to be usable with the LOWs. To accomplish this there were several adaptive changes required.

1. There has to be a means provided to remove all bore head feed system associated hardware from inside of the LOW after the installation.
2. An adaptor ring had to be designed to be built into the composite tube, into which the bore head is threaded for final assembly. The acceptance test of this ring will be conducted with the ring installed in the composite shell, in accordance with WHC-SD-WM-TP-294, and is outside the scope of this test plan.
3. The removal method of the water feed system after installation had to be designed to not impose torque on the composite tube or adaptor ring interface.
4. Neither the bore head nor the removed feed system is allowed to leak water or waste into the LOW after disconnect.

2.0 TEST OBJECTIVE

2.1 Evaluate the design to ensure the above-mentioned four requirements are met and that the design functions safely without requiring any special or extraordinary physical or mental ability.

2.2 Evaluate the quick disconnect for leak tight function.

2.3 Evaluate both check valves for leak tightness: the one directly above the feed system disconnect point which prevents the feed water in the feed pipe from leaking into the LOW during removal, and the other in the bore head which prevents the waste from leaking back into the LOW after removal of the water feed system.

Note: Both check valves are normally closed. The water feed system check valve directly in the female quick disconnect is mechanically held open by the male quick disconnect, while the check valve in the bore head is opened by the feed water pressure (at 150 psig).

2.4 Evaluate the quick disconnect locking ring to ensure that the design prevents accidental quick disconnect operation but releases every time when the willful release is initiated.

3.0 TEST PROGRAM

3.1 TEST SETUP

The 10-foot long test article is suspended above a 55-gallon drum. The drum is filled 10 to 16 inches with water, with the bore head 4 to 10 inches above the water. The bore head is connected through the support trailer to the high pressure intensifier. The test article differs from a LOW to permit testing and training. The differences are:

1. The test article is only 10 feet long.
2. The test article is all stainless steel construction, and the interface ring is simulated only by the internal thread.
3. The bore head is not seal welded in the assembly to permit disassembly, inspection, and reassembly.

3.2 TEST INSTRUMENTATION

The only instrumentation used during these tests are those on the intensifier and on the support trailer; no special instrumentation are required. Record visual observations.

3.3 TESTING

The following steps shall be followed during testing.

1. The pressure will be brought up to 35,000 psi at the intensifier (this represents 29,000 to 30,000 psi at the bore head) and flow will be held for five (5.0) minutes.
2. The intensifier will then be shut down and the high pressure hose disconnected.
3. The test article will be internally inspected for leaks (ensure that it is dry inside).
4. Install the air hose and wipe off the bore head to make sure it is completely dry.
5. Pressurize the feed system to 50 psig and hold pressure for 15 minutes while observing bore head for water seepage (none allowed).
6. Vent off pressure.
7. Remove the quick disconnect lock ring and disconnect the feed system; check the amount of feed water dripped during disconnect.
8. Dry and reassemble the test article. Repeat the above test five times.

3.4 SAFETY

To ensure safe operation, only qualified and approved operators will connect and operate the high pressure system. Normal precautions, customary with the very high pressure systems, will be observed/taken during these tests.

3.5 ACCEPTABLE PERFORMANCE

1. There shall be zero leakage during high pressure operation. Quality Control (QC) shall verify. *NAHA* LKG 5-2-95
2. With 50 psig test pressure, no dripping is permitted through the bore head offices. QC shall verify. *NAHA* LKG 5-2-95
3. After the feed system disconnect, there shall be no appreciable water in the bottom of the LOW. *NAHA* LKG 5-2-95
4. The quick disconnect shall not operate unless the lock ring is removed. QC shall verify. *NAHA* LKG 5-2-95

5. The lock ring shall fall off each time the release pins are pulled. QC shall verify. *not* LK6 5095

ACCEPTED BY:

LeVan Hooley
Quality Control

5/2/95
Date

V.G. Shuterdy
Test Engineer

05/02/95
Date

NOTE:

1. "Reverse Flow Test Fixture" was tested and found to be functioning as required per the design specifications, i.e. it was installed on the LOW borehead assembly and pressurized through a quick-disconnect installed into the center hole, and it held 90 psig for 10 minutes. *not*
2. "The Seal Plug" was screwed into the interface ring but due to lack of a LOW assembly and top plug it could not be pressure tested. *not*
3. "The Interface Test Fixture" could not be tested due to lack of a LOW assembly. *not*