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PROJECT W-314

SPECIFIC TEST AND EVALUATION PLAN

FOR 241-AX-B VALVE PIT UPGRADE

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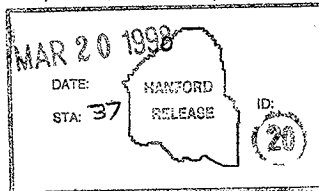
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Abstract: This Specific Test and Evaluation Plan (STEP) defines the test & evaluation activities encompassing the upgrades to the 241-AX-B Valve Pit for the W-314 Project.

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PROJECT W-314
SPECIFIC TEST AND EVALUATION PLAN
FOR
241-AX-B VALVE PIT UPGRADE

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1.0 PURPOSE

The purpose of this Specific Test and Evaluation Plan (STEP) is to provide a detailed written plan for the systematic testing of modifications made to the 241-AX-B Valve Pit by the W-314 Project. The STEP develops the outline for test procedures that verify the system's performance to the established Project design criteria. The STEP is a "lower tier" document based on the W-314 Test & Evaluation Plan (TEP).

2.0 SCOPE

This STEP encompasses all testing activities required to demonstrate compliance to the project design criteria as it relates to the modification of the 241-AX-B Valve Pit. The Project Design Specifications (PDS) identify the specific testing activities required for the Project. Testing includes Validations and Verifications (e.g., Commercial Grade Item Dedication activities...etc), Factory Acceptance Tests (FATs), installation tests and inspections, Construction Acceptance Tests (CATs), Acceptance Test Procedures (ATPs), Pre-Operational Test Procedures (POTPs), and Operational Test Procedures (OTPs). It should be noted that POTPs are not required for testing of the transfer line addition. The STEP will be utilized in conjunction with the TEP for verification and validation.

3.0 ADMINISTRATIVE

3.1 Safety Information/Communications

Testing and inspection activities will be performed to the safety and communication procedures of the testing facility (e.g., shop, mockup, tank farm, vendor facility...etc.)

During the performance of 241-AX-B Valve Pit ATPs and OTPs, the Operations Test Director will be the direct line of communication with the Shift Office. During abnormal and casualty situations, the Double-Shell Tank Farms Shift Manager will be the building emergency director/event commander.

4.0 GENERAL INFORMATION AND PREREQUISITES

4.1 Initial Conditions

Prerequisite tests and all required construction, specific to the test, shall be completed prior to beginning any test. Test boundaries shall be verified as being appropriate and secure. Required locks and tags shall be correctly placed to allow performance of the test without disturbing the lock and tag. Required personnel shall be available and briefed on the steps of the test (a pre-job briefing is a prerequisite that must be satisfied before performing a Construction Work Package (CWP), ATP, and/or OTP). Required test apparatus shall be functional and set up in a safe configuration for the test. Installed and existing equipment, required for the test, shall be verified to be ready to operate in the test conditions.

4.2 Measurement & Test Equipment

Instruments used will be specified per the test document and controlled per the performing agency's Measurement & Test Equipment program.

4.3 Functional Tests

Functional tests, when required for calibration of equipment, will be performed prior to the associated ATP or OTP. Functional tests will be performed to approved documents.

4.4 Temporary Modifications

Temporary modifications may be required in 241-AX Tank Farm. Temporary modifications will be made per HNF-IP-0842, Vol. IV, section 4.5.

4.5 Equipment and Materials

Equipment installed by the project that fails during testing, or existing equipment that is damaged by testing, will be the responsibility of the construction contractor. Existing facility SSCs, not damaged but found defective, will be the responsibility of Double-Shell Tanks organization. Initiation of repairs will be accomplished by the creation of either a work package, using JCS, or a Construction Work Package (CWP).

5.0 ASSIGNMENTS OF RESPONSIBILITY

The design agent (FDNW) will provide test directors for the Acceptance Test Procedures. Tank Farm Operations will provide a qualified Tank Farm Shift Manager or Operations Engineer who will be the Test Directors for all OTPs. This representative will accept the results of the ATPs for Tank Farm Operations. Roles and responsibilities for construction, TWRs Operations, TFRSO Startup Group, W-314 Project Management, Acceptance Inspection, and Quality Assurance are defined in the W-314 TEP, Chapter three.

5.1 Joint Test Review Group

The JTRG will consist of the Chief Test Director (from the TWRS Testing and Systems Readiness organization), Engineering manager (of the facility that will operate the equipment), W-314 Startup Manager, the Design Authority, applicable Test Director for each ATP & OTP, and W-314 Project Manager. The JTRG provides Tank Farm Operations with a high level of confidence that the test can be performed safely and efficiently. The review by the JTRG provides a basis for test procedure approval and release. The JTRG conducts thorough reviews of ATPs and OTPs to ensure compliance with applicable procedural requirements, to ensure they can be performed safely, and to ensure the scope of testing and inspections provide a product that satisfies operational and safety requirements. The JTRG reviews test procedure data, and provides their recommendation concerning the final acceptance that test results satisfy the design specifications as stated in the ATPs, OTPs, or test plans.

5.2 Test Configuration Control

Testing shall be conducted using detailed test procedures and the latest versions of all ECNs and Drawings for the Project. Configuration control shall conform to HNF-PRO-440 and HNF-PRO-226. Drawings shall be retained in project status by the W-314 Project until such time as all work on the 241-AX-B Valve Pit is complete and accepted.

6.0 SYSTEM BOUNDARIES

6.1 Objective

Specific system boundaries are identified for use in planning and implementing the various tests listed in this STEP. These system boundaries will provide safe work boundaries which allow testing to proceed in a safe environment, isolated from facility hazards.

6.2 Administrative Controls

Where actual physical isolations are not possible (e.g., pit nozzles...etc), Lock and Tag system (HNF-IP-0842, Vol. II, Sections 4.9.1 and 4.10.1), as a minimum, will be utilized to establish the required administrative controls.

6.3 Description

The table below lists the work and test boundaries for the 241-AX-B Valve Pit upgrades. These boundaries are estimates and may be modified at the time of execution to match current conditions in the farm and the job. This table will not be modified to reflect those changes.

TABLE 5-1 241-AX-B VALVE PIT UPGRADES WORK AND TEST BOUNDARIES

WORK ACTIVITY	PROJECT DRAWING	ESSENTIAL DRAWING	LOCK & TAG LOCATION	COMMENTS
Remove Cover Blocks and Jumpers in pit	H-14-101047 H-14-101051 H-14-101052	H-2-73749 H-2-86385, sh 3 H-2-86385, sh 11 H-2-86385, sh 15 H-2-86400	Lock and Tag Saltwell pump A-101 at MCC-A7. Lock and tag Saltwell pump AX-101 at MCC-A4. Dennergize the AX-B jumper test trace enclosure by locking and tagging breaker 14 in panelboard VPAX-B. Remove the AX-B lock detector from service by locking and tagging circuit CBA at the 242-A evaporator. Lock and Tag AY-01D and AY-02D pumps at MCC-AY.	
Excavation for Transfer line and nozzle installation	H-14-100855 H-14-100857 H-14-101002 H-14-101047 H-14-101048 H-14-101118 H-14-101119	H-2-86385, sh 2,3 H-2-73749, sh 6 H-2-86385, sh 11 H-2-86385, sh 15 H-2-86385, sh 16 H-2-86385, sh 17 H-2-86385, sh 18	Lock and tag heat trace for lines SL-100, SL-101, SN-219200 and SN-2140201 at MCC-A4. Lock and Tag Heat trace for SL-108, SL-111, SN-208 and SN-211 at panelboard VPAX-A. Lock and Tag Saltwell pump A-101 at MCC-A7. Lock and tag Saltwell pump AX-101 at MCC-A4. Dennergize the AX-B jumper test trace enclosure by locking and tagging breaker 14 in panelboard VPAX-B. Remove the AX-B lock detector from service by locking and tagging circuit CBA at the 242-A evaporator. Lock and Tag AY-01D and AY-02D pumps at MCC-AY. 1. The remainder of the circuits to be dennergized to be determined based on exact areas to be excavated and results of surface scan.	
Cap & Cap SN-219200 at AX-B Valve Pit	H-14-101113 H-14-101047		Verify Process blank on L3 at AX-501 condensate pit. Nozzle R12 in AX-B Valve pit should have an isolation or a process blank.	H-2-71303
Install new nozzle R12 at AX-B valve pit.	H-14-101047 H-14-101113, sh 6 H-14-101074, sh 2	H-2-73749		
Cap & Cap SN-219200 at AX-B Valve Pit	H-14-101047 H-14-101113, sh 2 H-14-101074, sh 2	H-2-86385, sh 2 H-2-86385, sh 15	Lock and Tag Instrument Air to PSN-219200 in the 242-A Evaporator condenser loop. Lock and Tag Heat Trace for line SN-219200 at panelboard VPAX-A.	
Install new nozzle R1 at AX-B valve pit.	H-14-101047 H-14-101074, sh 2 H-14-101113			
Install new nozzle R20 at AX-B valve pit	H-14-101047 H-14-101074, sh 2 H-14-101113			
Install conduit and make connections at panelboard DP-AX-008	H-14-101011 H-14-101009	H-2-86385, sh 2 H-2-86385, sh 22	Lock and tag breaker #8 in panelboard VPAX-A	
Remove old pit leak detector and install terminal box WTBX-W314-10.	H-14-101009	H-2-86385, SH 15	Remove the AX-B lock detector from service by locking and tagging circuit CBA at the 242-A evaporator.	
Pressure Test of new nozzles	H-14-101047			After completion of the final pressure test, direct to R2-01 or R2-102 as directed by operations.
Jumpers Leak test	H-14-10147	H-2-73749 H-2-86400 H-2-86385, sh 3	Lock and Tag AY-01D and AY-02D pumps at MCC-AY.	
Jumpers Hydro Test R1-R20 (Q&E)	H-14-101061		SHOP TEST	
Jumpers Hydro Test R12 (O)	H-14-101062		SHOP TEST	
Jumpers Hydro Test R16 (E)	H-14-101063		SHOP TEST	

6.4 System Turnover

Following completion and acceptance of all the required testing and testing data within a given boundary, the systems and equipment in that area will be ready for release to operations for their control and use. The SSC(s) will be released to TWRs Operations by using the Acceptance for Beneficial Use process described in the W-314 TEP (HNF-SD-W314-001).

7.0 TEST AND ACCEPTANCE

The Project W-314 241-AX-B Valve Pit Upgrade STEP includes design verifications performed by various methods including engineering analysis, Vendor data review, FATs and CATs performed in accordance with Procurement/Construction Specifications, drawings, and system functional tests performed in accordance with ATPs and OTPs. These verifications and tests will be documented in the W-314 Project 200 East Upgrades Requirements Verification Report (RVR), HNF-2257, Rev.0, and in specific test documentation (e.g., ATRs, OTRs, CWP...etc.). In addition, approved calibration and functional test procedures will be performed in preparation for the above listed tests.

7.1 Validation and Verification

All design requirements listed in the Project Development Specifications are formally reviewed by analysis and examination for project compliance. Commercial grade equipment utilized in Safety Class applications, will be qualified per appropriate procedures and programs. Equipment used in non-safety class applications will be verified using vendor data to ensure the design requirements of the application are met. These reviews are documented in the 200 East Upgrades RVR. This report is listed in the reference section of this document.

7.2 Commercial Grade Item Dedication

The following table lists the testing that will be performed to satisfy the Commercial Grade Item Dedication requirements for the upgrades to the 241-AX-B Valve Pit. Note that acceptance criteria are included in the individual drawings, specifications, procedures, and CWP's.

TABLE 7-2

COMMERCIAL GRADE ITEM DEDICATION ACTIVITIES					
TEST NUMBER	TEST NAME	REFERENCE DOCUMENT	LOCATION	TEST DOCUMENT	INTERDEPENDENCIES
1.4.E.E.CG.1	Rebar Tensile Test and Physical Inspection	W-314-C2, section 03300, 1.5.2.2;	Shop		Test reports must be in place prior to installing any Rebar.
1.4.E.E.CG.2	Steel Plate, bar and shape Tensile test and physical inspection	W-314-C2, section 05500, 1.3.2.1	Shop		Test reports must be in place prior to installing any items for which testing was required.
1.4.E.E.CG.3	Commercial Grade Dedication for instrumentation	W-314-C2, section 13440, 2.3.2; RVR App.C 3.3.5.1	Shop		Tests must be documented as acceptable prior to installing any components in field locations
1.4.E.E.CG.4	Commercial Grade Dedication for Piping Materials, verify pipe size	W-314-C2, section 15493, 1.2.3.1 and 2.4; RVR App.A 3.2.2.6	Shop		Test Reports must be accepted prior to fabrication of piping spools.
1.4.E.E.CG.5	Commercial Grade Dedication for Electrical	W-314-C2, section 16400, 2.4.1	Shop		Test Reports must be accepted prior to fabrication of piping spools.

7.3 Factory Acceptance Testing

The following table lists the FATs that will be performed for modifications to 241-AX-B Valve Pit. Note that acceptance criteria are included in the individual drawings, specifications, procedures, and CWP's.

TABLE 7-3

FACTORY ACCEPTANCE TESTS					
TEST NUMBER	TEST NAME	REFERENCE DOCUMENT	LOCATION	TEST DOCUMENT	INTERDEPENDENCIES
1.4.E.E.F.1	Hydro and Leak tests	W-314-P1, section 3.9	Factory		Prior to shipping

7.4 Construction Acceptance Testing

The table below lists the construction tests performed during fabrication, modification and installation to verify functionality of structures, systems and components following installation. AI inspection activities performed during construction are referenced in "ACCEPTANCE INSPECTION PLAN FOR 200 EAST/WEST UPGRADES", W-314-C2-1, REV. 0. Note that acceptance criteria are included in the individual test drawings, specifications, procedures, and CWP's.

TABLE 7-4

CONSTRUCTION ACCEPTANCE TESTS					
TEST NUMBER	TEST	REFERENCE DOCUMENT	LOCATION	TEST DOCUMENT	INTERDEPENDENCIES
1.4.E.E.C.1	In-Place Density Test	W-314-C2, section 02220, 3.1.7.2	Field	CWP	Required prior to excavation for all excavations
1.4.E.E.C.2	Backfill Density Test	W-314-C2, section 02220, 3.3, 3.4, 3.5, 3.7.1; RVR App.A 3.3.1.6, 3.3.1.7	Field	CWP	During & after backfill
1.4.E.E.C.3	Concrete Slump Test	W-314-C2, section 03300, 1.5.2.1, 3.4.1; RVR App.A 3.3.1.4, App.B 3.3.4.2	Field	CWP	During concrete placement
1.4.E.E.C.4	Concrete Air Content Test	W-314-C2, section 03300, 1.5.2.1, 3.4.1; RVR App.A 3.3.1.4, App.B 3.3.4.2	Field	CWP	During concrete placement
1.4.E.E.C.5	Concrete Test Cylinders	W-314-C2, section 03300, 1.5.2.1; RVR App.A 3.3.1.4, App.B 3.3.4.2	Field, Lab	Testing Agency Report	Cast cylinders during concrete placement
1.4.E.E.C.6	Concrete Preplacement Inspections	W-314-C2, section 03300, 3.1, 3.2.1, 3.2.2.1, & 3.4.2; RVR App.B 3.7.3.2.4	Field	CWP & Concrete pour slip	Prior to Placing Concrete
1.4.E.E.C.7	Concrete Placement Inspections	W-314-C2, section 03300, 3.2 & 3.4.2	Field	CWP	During concrete placement
1.4.E.E.C.8	Concrete Post-Placement Inspections	W-314-C2, section 03300, 3.2, 3.3 & 3.4.2	Field	CWP	Prior to Cover block Installation.
1.4.E.E.C.9	Expansion Anchor Inspections	W-314-C2, section 05055, 3.4.1	Field	CWP	During anchor installation
1.4.E.E.C.10	Structural Weld Examinations	W-314-C2, section 05500, 3.4.1, 3.4.2	Shop, Field	CWP	Prior to coating any structural pieces.
1.4.E.E.C.11	Cover Block Special Protective Coating Surface Preparation Inspection	W-314-C2, section 09855, 3.1.1 & 3.4.2; RVR App.D 3.3.1.2.1	Shop, Field	CWP	Prior to application of coatings
1.4.E.E.C.12	Cover Block Special Protective Coating Application	W-314-C2, section 09855, 1.2.2.2, 1.3.2, 1.4.1, 3.4.1; RVR App.D 3.2.2.1, 3.2.2.2, 3.2.2.8, 3.2.3, 3.2.4.1	Shop, Field	CWP	During application of each coat
1.4.E.E.C.13	Pit Special Protective Coating Surface Preparation Inspection	W-314-C2, section 09855, 3.1.1 & 3.4.2; RVR App.D 3.3.1.2.1	Shop, Field	CWP	Prior to application of coatings
1.4.E.E.C.14	Pit Special Protective Coating Application	W-314-C2, section 09855, 1.2.2.2, 1.3.2, 1.4.1, 3.4.1; RVR App.D 3.2.2.1, 3.2.2.2, 3.2.2.8, 3.2.3, 3.2.4.1	Shop, Field	CWP	During application of each coat
1.4.E.E.C.15	Cover Block Painting Diagrams	W-314-C2, section 09855, 3.3.6 & 3.4.2; RVR App.B 3.7.3.2.5	Shop	CWP	Verify painting diagram matches information given in drawing s referenced in section 3.3.6.

CONSTRUCTION ACCEPTANCE TESTS					
TEST NUMBER	TEST	REFERENCE DOCUMENT	LOCATION	TEST DOCUMENT	INTERDEPENDENCIES
1.4.E.E.C.16	Leak Detector Fabrication Wiring Continuity	W-314-C2, section 13440, 3.2.1.1 & section 16400, 3.3.2.1	Shop, Field	CWP	Complete prior to performing ATP.
1.4.E.E.C.17	Leak Detector Cabinet Wiring Continuity	W-314-C2, section 13440, 3.2.1.1 & section 16400, 3.3.2.1	Shop, Field	CWP	Complete prior to performing ATP.
1.4.E.E.C.18	Cover Block Installation Wiring Continuity	W-314-C2, section 13440, 3.2.1.1 & section 16400, 3.3.2.1	Shop, Field	CWP	Complete prior to performing ATP.
1.4.E.E.C.19	Terminal Box Conduit & Cable Installation Wiring Continuity	W-314-C2, section 13440, 3.2.1.1 & section 16400, 3.3.2.1	Shop, Field	CWP	Complete prior to performing ATP.
1.4.E.E.C.20	Valve Limit Switch Wiring Continuity	W-314-C2, section 13440, 3.2.1.1 & section 16400, 3.3.2.1	Shop, Field	CWP	Complete prior to performing ATP.
1.4.E.E.C.21	Leak Detector Installation Wiring Continuity	W-314-C2, section 13440, 3.2.1.1 & section 16400, 3.3.2.1	Shop, Field	CWP	Complete prior to performing ATP.
1.4.E.E.C.22	Cover Block Wiring Shielding Resistance to Ground	W-314-C2, section 13440, 3.2.1.2	Field	CWP ¹	Complete prior to performing ATP
1.4.E.E.C.23	Terminal Box Conduit & Cable Shielding Resistance to Ground	W-314-C2, section 13440, 3.2.1.2	Field	CWP	Complete prior to performing ATP
1.4.E.E.C.24	Valve Limit Switch Shielding Resistance to Ground	W-314-C2, section 13440, 3.2.1.2	Field	CWP	Complete prior to performing ATP
1.4.E.E.C.25	Leak Detector Shielding Resistance to Ground	W-314-C2, section 13440, 3.2.1.2	Field	CWP	Complete prior to performing ATP
1.4.E.E.C.26	Leak Detector Fabrication Voltage Verification	W-314-C2, section 16400, 3.3.2.2	Field	CWP	Prior to energizing equipment.
1.4.E.E.C.27	Leak Detector Installation Voltage Verification	W-314-C2, section 16400, 3.3.2.2	Field	CWP	Prior to energizing equipment.
1.4.E.E.C.28	Holiday Testing of Piping Protective Coatings	W-314-C2, section 15493, 3.1.6.2	Field	CWP	Prior to Backfill.
1.4.E.E.C.29	Piping Fabrication Welding Non-Destructive Examination	W-314-C2, section 15493, 3.2.1 & Appendix A, 3.3 & 4.1; RVR App. A 3.3.1.5, 3.3.4, App. B 3.3.4.1	Shop, Field	CWP	Prior to any form of pressure testing.
1.4.E.E.C.30	Jumper Fabrication Welding Non-Destructive Examination	W-314-C2, section 15493, 3.2.1 & Appendix A, 3.3 & 4.1; RVR App. A 3.3.1.5, 3.3.4, App. B 3.3.4.1	Shop, Field	CWP	Prior to any form of pressure testing.
1.4.E.E.C.31	Piping Fabrication Cleanliness Inspection	W-314-C2, section 15493, 3.2.3.5; RVR App. A 3.3.4	Shop, Field	CWP	Prior to any form of pressure testing
1.4.E.E.C.32	Piping Fabrication Pressure Tests	W-314-C2, section 15493, 3.2.4; RVR App. A 3.3.1.2	Field	CWP	
1.4.E.E.C.33	Piping Installation Cleanliness Inspection	W-314-C2, section 15493, 3.2.3.5; RVR App. A 3.3.4	Shop, Field	CWP	Prior to any form of pressure testing
1.4.E.E.C.34	Piping Installation Pressure Tests	W-314-C2, section 15493, 3.2.4; RVR App. A 3.3.1.2	Field	CWP	
1.4.E.E.C.35	Jumper Pressure Tests	W-314-C2, section 15493, Appendix A, 3.6 & 4.3; RVR App. B 3.2.1.2.5	Shop	CWP	Test all Jumpers prior to installation in the valve pit
1.4.E.E.C.36	Jumper Fabrication Inspections	W-314-C2, section 15493, Appendix A, 4.2	Shop	CWP	Prior to shop hydro
1.4.E.E.C.37	Jumper In service Leak Test	HNF-SD-BIO-001, section 5.3.2.18, TSR-006, AC 5.12.2.a	Field	CWP and Leak Test Procedure	Installation of all jumpers and required changes at associated tank central pump pits and valve pits.

CONSTRUCTION ACCEPTANCE TESTS					
TEST NUMBER	TEST	REFERENCE DOCUMENT	LOCATION	TEST DOCUMENT	INTERDEPENDENCIES
1.4.E.E.C.38	Leak Detector Cabinet Installation Electrical & Instrumentation Configuration & Code Compliance	W-314-C2, section 16400, 3.3.1; RVR App. A 3.3.1.10, 3.3.1.11, 3.3.1.12, App. C 3.3.1.1, 3.3.1.2	Field	CWP	Prior to performing OTP
1.4.E.E.C.39	Terminal Box Conduit & Cable Installation Electrical & Instrumentation Configuration & Code Compliance	W-314-C2, section 16400, 3.3.1; RVR App. A 3.3.1.10, 3.3.1.11, 3.3.1.12, App. C 3.3.1.1, 3.3.1.2	Field	CWP	Prior to performing OTP
1.4.E.E.C.40	Leak Detector Installation Electrical & Instrumentation Configuration & Code Compliance	W-314-C2, section 16400, 3.3.1; RVR App. A 3.3.1.10, 3.3.1.11, 3.3.1.12, App. C 3.3.1.1, 3.3.1.2	Field	CWP	Prior to performing OTP
1.4.E.E.C.41	Valve Limit Switch Installation Electrical & Instrumentation Configuration & Code Compliance	W-314-C2, section 16400, 3.3.1; RVR App. A 3.3.1.10, 3.3.1.11, 3.3.1.12, App. C 3.3.1.1, 3.3.1.2	Field	CWP	Prior to performing OTP
1.4.E.E.C.42	Piping Installation Configuration Verification	RVR App. A 3.2.2.1, 3.2.2.7, 3.2.2.8, 3.2.2.9, 3.2.2.10, 3.3.1.8	Shop, Field	CWP	Prior to installation of the wall nozzles and piping
1.4.E.E.C.43	Jumper Installation Piping Configuration Verification	RVR App. A 3.2.2.1, 3.2.2.7, 3.2.2.8, 3.2.2.9, 3.2.2.10, 3.3.1.8	Shop, Field	CWP	Prior to installation of the wall nozzles and piping
1.4.E.E.C.44	Cathodic Protection	W-314-C1, section 16640, 3.3.1, 3.3.2	Field	CWP	After piping installation and prior to application of protective coating on pipe
1.4.E.E.C.45	Jumper Fit Up & Installation	TWRS Operations Requirement	Field	CWP	TWRS Operations witness jumper fit up, balance, & installation
1.4.E.E.C.46	Cover Block Fit Up & Installation	TWRS Operations Requirement	Field	CWP	TWRS Operations witness jumper fit up, balance, & installation
1.4.E.E.C.47	Load test Cover Block lifting balls & Lifting bail Magnetic Particle Test	W-314-C1, 03300, section 3.2.5	Shop	CWP	Prior to Special Protective Coating Application/Installation. Lifting bail Mag. Particle test must be performed AFTER load test.
1.4.E.E.C.48	Jumper support leg adjustment	H-14-100948, Note 7 H-14-100949, SH1, Note 7 H-14-100950, SH1, Note 7 H-14-100952, SH1, Note 7 H-14-100953, SH1, Note 7	Field	CWP	Prior to Cover Block installation
1.4.E.E.C.49	Final Special Protective Coating inspection of pit & cover block	W-314 Project Management requirement	Field	CWP	Prior to installation of cover block

7.5 Acceptance Testing

Acceptance testing will be conducted by utilizing ATPs. ATPs are separate "stand alone" documents which obtain their requirements from the applicable PDS, drawings, and vendor data. ATPs will ensure that the SSCs are fabricated and/or installed properly per the design. Detailed ATPs will be required after the CAT functional checks and/or inspections are completed and, will validate overall SSC installation as a whole. The acceptance criteria shall be specified in the test procedures and/or on approved drawings and specifications. These tests will be performed on components in their installed condition but may not exercise the entire system as an operational unit. The table below describes the ATPs that will be performed for 241-AX-B Valve Pit acceptance testing. An Acceptance Test Report (ATR) will be generated when all test exceptions have been cleared and the test has been successfully completed. Note that acceptance criteria are included in the individual test document.

TABLE 7-5

ACCEPTANCE TEST PROCEDURES				
TEST DOCUMENT	TEST DESCRIPTION	REFERENCE DOCUMENT	LOCATION	INTERDEPENDENCIES
TBD	Pit Leak Detection	HNF-SD-W314-PDS-003; RVR App. A 3.3.2, 3.7.2.1.2.1, 3.7.2.1.2.2, 3.7.2.1.2.3, 3.7.2.1.3.1, 3.7.2.1.3.2, 3.7.2.1.3.3, App. B 3.3.2, App. C 3.2.2.5, 3.3.2	Field	Leak Detector installed and energized
TBD	Encasement Leak Detection	HNF-SD-W314-PDS-003; RVR App. A 3.2.4.5, 3.3.2, 3.7.2.1.2.1, 3.7.2.1.2.2, 3.7.2.1.2.3, 3.7.2.1.3.1, 3.7.2.1.3.2, 3.7.2.1.3.3, App. B 3.3.2, App. C 3.2.2.5, 3.3.2	Field	Leak Detector installed and energized
TBD	Valve Manifold and Indicators (Position Switches)	HNF-SD-W314-PDS-002; RVR App. B 3.7.2.1.1.4, 3.7.2.2.1, 3.7.2.2.3, 3.7.2.2.4	Field	After equipment installation on cover block

7.6 Operational Testing

Operational testing will be conducted by utilizing OTPs. OTPs will be planned, scheduled, and conducted, on the installed SSCs, after completion and acceptance of all other test results. These detailed procedures shall determine if the installed SSCs meet the PDS functional requirements. Included in the OTP will be acceptance criteria to delineate pass/fail requirements. Operational testing is performed with actual plant equipment, operating procedures, and personnel. If an OTP has been generated but the testing of the corresponding SSC won't be performed for an extended period of time (e.g., a year or more), then the OTP must be reviewed again, prior to performance of the test, to ensure that it is still applicable. A Operational Test Report (OTR) will be generated when all test exceptions have been cleared and the test has been successfully completed. Testing of valve operators (with the valves connected), drain plug and leak detectors will be conducted with these components in their normal operating positions. Test conditions will meet the required code, design and authorization basis (i.e., Basis for Interim Operation, Technical Safety Requirements, and HNF-IP-1266, "TANK FARM OPERATIONS ADMINISTRATIVE CONTROLS") to verify that the system is functional and safe to operate. The following table describes the various sections of the OTP for the 241-AX-B Valve Pit modifications. Note that acceptance criteria are included in the individual test document.

TABLE 7-6

OPERATIONAL TEST PROCEDURE					
Test Section	Test Description	Reference Document	Location	Test Document	Interdependencies
TBD	Architectural: This section verifies that all components are physically in place per the drawings, that they have been correctly labeled, painted, etc. Items included are electrical boxes, cover blocks, shielding blocks, valve operators, position indicators, valve handles, drain plug handles, and jumpers between cover blocks and terminal boxes. Piping jumpers and internal pit coating are specifically excluded from this inspection as they will be verified as part of earlier construction tests witnessed by operations.	RVR App. A 3.3.3.1, App. B 3.2.1.1.1, 3.2.2.1, 3.2.2.2, 3.3.3.1, 3.7.3.1.1.1, 3.7.3.2.1, 3.7.3.2.3, App. C 3.3.3.1	Field	TBD	All equipment in place,
TBD	Valve Operation: This section tests the operation of the valve operators and valve position indication. Operators are verified to be able to move the valves and remote indication of the position switches at the terminal box is verified for all positions of each valve. Verify functionality of valve locking devices.		Field	TBD	All equipment in place. Locks and tags in place to prevent inadvertent transfer of waste.
TBD	Leak Detector and Drain plug Operation: This section verifies the operation of the leak detector and the drain plug by adding water to the pit until the leak detector actuates the alarms at 271-AN and all other appropriate locations, and actuates the master pump shutdown. Acceptance criteria for operation is the amount and rate of water that the system should detect per the design verification report. This detection test shall be repeated no less than three (3) times.	RVR App. A 3.3.5, App. C 3.2.4.4	Field	TBD	All equipment in place, current calibration of the leak detector and the master pump shutdown system not in alarm.

7.7 241-AX-B Valve Pit Upgrade Test Completion

The 241-AX-B Valve Pit testing will be considered successfully completed when the **TEST COMPLETION CHECKLIST** (attached to the end of this STEP) is completely signed off. This checklist is a "stand alone" document that will be listed on the 241-AX-B Valve Pit Upgrade ABU (HNF-SD-W314-ABU-005) and included in the turnover of documents. This checklist will be completed by the W-314 Startup Manager or his designee.

REFERENCES

- HNF-PRO-229, *Technical Procedure Standard*, Fluor Daniel Hanford Company, Richland, Washington.
- HNF-PRO-242, Rev. 1, *Engineering Drawing Requirements*, Fluor Daniel Hanford Company, Richland, Washington.
- HNF-PRO-440, *Engineering Document Change Control Requirements*, Fluor Daniel Hanford Company, Richland, Washington.
- HNF-PRO-446, *Testing Practices Requirements*, Fluor Daniel Hanford Company, Richland, Washington.
- HNF-PRO-572, *Project Acceptance and Closeout*, Fluor Daniel Hanford Company, Richland, Washington.
- W-314-C2, *Construction Specification for Tank Farm Restoration and Safe Operations 200 East Upgrades*, Fluor Daniel Northwest, Inc., Richland, Washington.
- HNF-SD-W314-PDS-001, Rev. 0, *Project Development Specification - Transfer Piping*, Fluor Daniel Northwest, Inc., Richland, Washington.
- HNF-SD-W314-PDS-002, Rev. 0, *Project Development Specification for Valve Pit Manifold*, Fluor Daniel Northwest, Inc., Richland, Washington.
- HNF-SD-W314-PDS-003, Rev. 0, *Project Development Specification for Pit Leak Detection*, Fluor Daniel Northwest, Inc., Richland, Washington.
- HNF-SD-W314-PDS-005, Rev. 0, *Project Development Specification for Special Protective Coating*, Fluor Daniel Northwest, Inc., Richland, Washington.
- HNF-2257, Rev. 0, *Requirements Verification Report for 200 East Upgrades (WBS 1.4.E)*, Fluor Daniel Northwest, Inc., Richland, Washington.
- HNF-SD-W314-ABU-005, Rev. 0, *AX-B Valve Pit Upgrade Acceptance For Beneficial Use*, Rev. 0, Numatec Hanford Corporation, Richland, Washington.
- HNF-SD-W314-TEP-001, Rev. 0, *Test and Evaluation Plan for W-314 Tank Farm Restoration and Safe Operations*, Numatec Hanford Corporation, Richland, Washington.
- HNF-CM-3-5, *Document Control and Records Management*, Fluor Daniel Hanford Company, Richland, Washington.
- HNF-IP-0842, *TWRS Administration*, Fluor Daniel Hanford Company, Richland, Washington.
- HNF-IP-1266, *Tank Farm Operations Administrative Controls*, Fluor Daniel Hanford Company, Richland, Washington.
- HNF-SD-WM-BIO-001, Rev. F, *TWRS Basis for Interim Operation*, Fluor Daniel Hanford Corporation, Richland, Washington.
- W-314-C2-1, Rev. 0, *Acceptance Inspection Plan for 200 East/West Upgrades*, Fluor Daniel Hanford Corporation, Richland, Washington.

241-AX-B VALVE PIT UPGRADE TEST COMPLETION CHECKLIST

TEST NUMBER	TEST NAME	TEST PROCEDURE/DOCUMENT NUMBER	DATE TEST COMPLETED	TEST COMPLETED AND RESULTS ACCEPTED (i.e., ALL EXCEPTIONS RESOLVED)	PRINT NAME	SIGNATURE
COMMERCIAL GRADE ITEM DEDICATION ACTIVITIES						
1.4.E.E.CG.1	Rebar Tensile Test and Physical Inspection					
1.4.E.E.CG.2	Steel Plate, bar and shape Tensile test and physical inspection					
1.4.E.E.CG.3	Commercial Grade Dedication for instrumentation					
1.4.E.E.CG.4	Commercial Grade Dedication for Piping Materials					
1.4.E.E.CG.5	Commercial Grade Dedication for Electrical					
FACTORY ACCEPTANCE TESTS						
1.4.E.E.F.1	Hydro and Leak tests					
CONSTRUCTION ACCEPTANCE TESTS						
1.4.E.E.C.1	In-Place Density Test					
1.4.E.E.C.2	Backfill Density Test					
1.4.E.E.C.3	Concrete Slump Test					
1.4.E.E.C.4	Concrete Air Content Test					
1.4.E.E.C.5	Concrete Test Cylinders					
1.4.E.E.C.6	Concrete Pre-placement Inspections					

241-AX-B VALVE PIT UPGRADE TEST COMPLETION CHECKLIST

TEST NUMBER	TEST NAME	TEST PROCEDURE DOCUMENT NUMBER	DATE TEST COMPLETED	TEST COMPLETED AND RESULTS ACCEPTED (i.e., ALL EXCEPTIONS RESOLVED)	
				PRINT NAME	SIGNATURE
1.4.E.E.C.7	Concrete Placement Inspections				
1.4.E.E.C.8	Concrete Post-Placement Inspections				
1.4.E.E.C.9	Expansion Anchor Inspections				
1.4.E.E.C.10	Structural Weld Examinations				
1.4.E.E.C.11	Cover Block Special Protective Coating Surface Preparation Inspection				
1.4.E.E.C.12	Cover Block Special Protective Coating Surface Preparation Inspection				
1.4.E.E.C.13	Pit Special Protective Coating Application				
1.4.E.E.C.14	Pit Special Protective Coating Application				
1.4.E.E.C.15	Cover Block Painting Diagrams				
1.4.E.E.C.16	Leak Detector Fabrication Wiring Continuity				
1.4.E.E.C.17	Leak Detector Cabinet Installation Wiring Continuity				
1.4.E.E.C.18	Cover Block Installation Wiring Continuity				
1.4.E.E.C.19	Terminal Box Conduit & Cable Installation Wiring Continuity				

241-AX-B VALVE PIT UPGRADE TEST COMPLETION CHECKLIST

PAGE ____ OF ____

TEST NUMBER	TEST NAME	TEST PROCEDURE DOCUMENT NUMBER	DATE TEST COMPLETED	TEST COMPLETED AND RESULTS ACCEPTED (i.e., ALL EXCEPTIONS RESOLVED)	PRINT NAME	SIGNATURE
1.4.E.E.C.20	Valve Limit Switch Wiring Continuity					
1.4.E.E.C.21	Leak Detector Installation Wiring Continuity					
1.4.E.E.C.22	Cover Block Wiring Shielding Resistance to Ground					
1.4.E.E.C.23	Terminal Box Conduit & Cable Shielding Resistance to Ground					
1.4.E.E.C.24	Valve Limit Switch Shielding Resistance to Ground					
1.4.E.E.C.25	Leak Detector Shielding Resistance to Ground					
1.4.E.E.C.26	Leak Detector Fabrication Voltage Verification					
1.4.E.E.C.27	Leak Detector Installation Voltage Verification					
1.4.E.E.C.28	Holiday Testing of Piping Protective Coatings					
1.4.E.E.C.29	Piping Fabrication Welding Non-Destructive Examination					
1.4.E.E.C.30	Jumper Fabrication Welding Non-Destructive Examination					
1.4.E.E.C.31	Piping Fabrication Cleanliness Inspection					
1.4.E.E.C.32	Piping Fabrication Pressure Tests					

241-AX-B VALVE PIT UPGRADE TEST COMPLETION CHECKLIST

PAGE ____ OF ____

TEST NUMBER	TEST NAME	TEST PROCEDURE DOCUMENT NUMBER	DATE TEST COMPLETED	TEST COMPLETED AND RESULTS ACCEPTED (i.e., ALL EXCEPTIONS RESOLVED)	PRINT NAME	SIGNATURE
1.4.E.E.C.33	Piping Installation Cleanliness Inspection					
1.4.E.E.C.34	Piping Installation Pressure Tests					
1.4.E.E.C.35	Jumper Pressure Tests					
1.4.E.E.C.36	Jumper Fabrication Inspections					
1.4.E.E.C.37	Jumper In service Leak Test & Pit Configuration Verification					
1.4.E.E.C.38	Leak Detector Cabinet Installation Electrical & Instrumentation Configuration & Code Compliance					
1.4.E.E.C.39	Terminal Box Conduit & Cable Installation Electrical & Instrumentation Configuration & Code Compliance					
1.4.E.E.C.40	Leak Detector Installation Electrical & Instrumentation Configuration & Code Compliance					
1.4.E.E.C.41	Valve Limit Switch Installation Electrical & Instrumentation Configuration & Code Compliance					
1.4.E.E.C.42	Piping Installation Configuration Verification					
1.4.E.E.C.43	Jumper Installation Piping Configuration Verification					
1.4.E.E.C.44	Cathodic Protection					

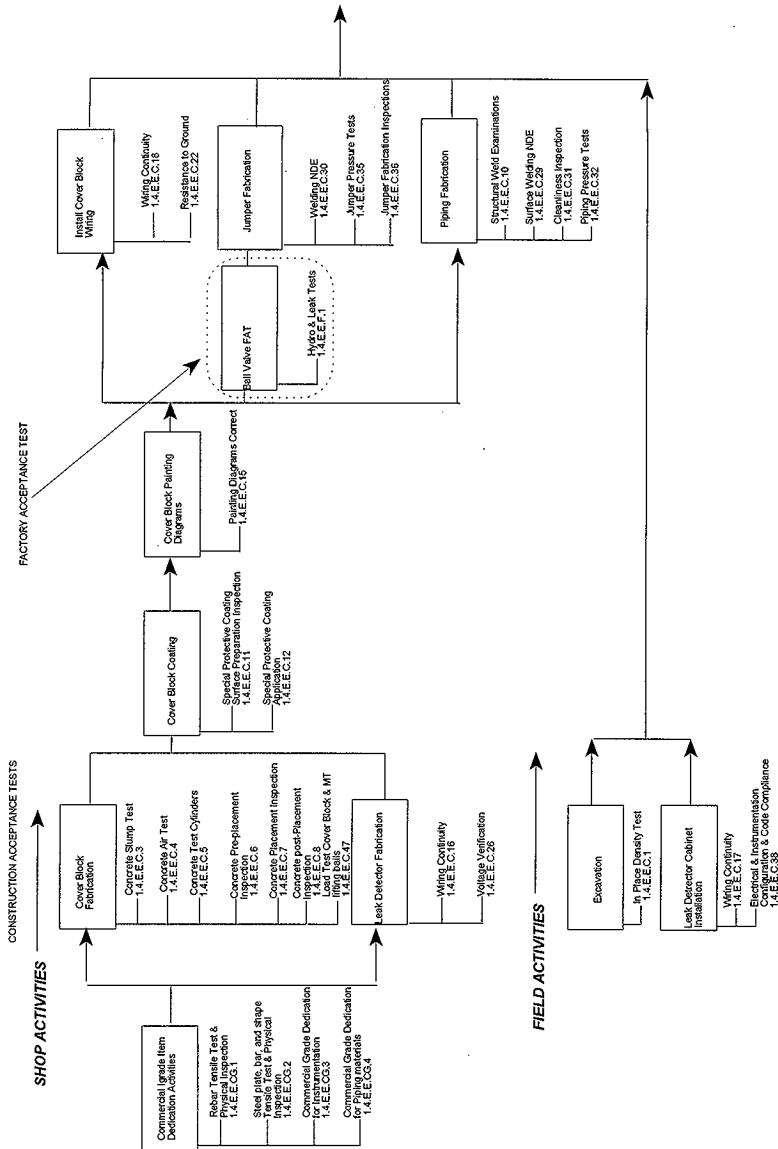
241-AX-B VALVE PIT UPGRADE TEST COMPLETION CHECKLIST

TEST NUMBER	TEST NAME	TEST PROCEDURE DOCUMENT NUMBER	DATE TEST COMPLETED	TEST COMPLETED AND RESULTS ACCEPTED (i.e., ALL EXCEPTIONS RESOLVED)	
				PRINT NAME	SIGNATURE
1.4.E.E.C.45	Jumpers Fit Up & Installation				
1.4.E.E.C.46	Cover Block Fit Up & Installation				
1.4.E.E.C.47	Load test Cover Block lifting balls & Lifting ball Magnetic Particle Test				
1.4.E.E.C.48	Jumpers support leg adjustment				
1.4.E.E.C.49	Final Special Protective Coating inspection of pit & cover block				
ACCEPTANCE TEST PROCEDURES					
TBD	Pit Leak Detection				
TBD	Encasement Leak Detection				
TBD	Valve Manifold and Indicators (Position Switches)				
OPERATIONAL TEST PROCEDURE					
	Architectural: This section verifies that all components are physically in place per the drawings, that they have been correctly labeled, painted, etc. Items included are electrical boxes, cover blocks, shielding blocks, valve operators, position indicators, valve handles, and piggybacked jumpers between cover blocks and terminal boxes. Piping jumpers and internal pit coating are specifically excluded from this inspection as they will be verified as part of earlier construction tests witnessed by operations.				

241-AX-B VALVE PIT UPGRADE TEST COMPLETION CHECKLIST

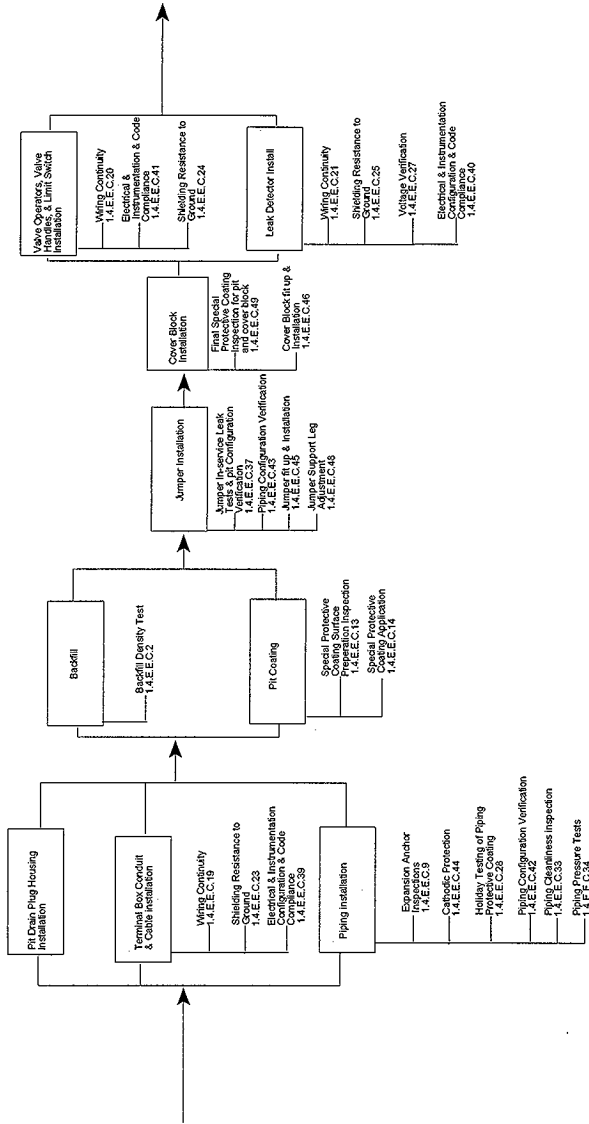
TEST NUMBER	TEST NAME	TEST PROCEDURE DOCUMENT NUMBER	DATE TEST COMPLETED	TEST COMPLETED AND RESULTS ACCEPTED (i.e., ALL EXCEPTIONS RESOLVED)	
				PRINT NAME	SIGNATURE
	Valve Operation: This section verifies the operation of the valve operators and valve position indication. Operators are verified to be able to move the valves and remote indication of the position switches at the terminal box is verified for all positions of each valve. Verify functionality of valve locking devices.				
	Leak Detector and Drain plug Operation: This section verifies the operation of the leak detector and the drain plug by adding water to the pit until the leak detector actuates the alarms at Z71-AN and all other appropriate detectors, and actuates the master pump shutdown. Acceptance criteria for operation is the amount and rate of water that the system should detect per the design verification report. This detection test shall be repeated no less than three (3) times.				

241-AX-B VALVE PIT UPGRADE LOGIC DIAGRAM (SEE TEP FIGURE B-3 FOR HIGHER LEVEL LOGIC)



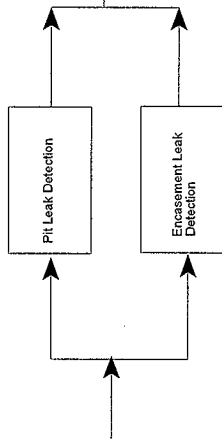
241-AX-B VALVE PIT UPGRADE LOGIC DIAGRAM [cont.] (SEE TEP FIGURE B-3 FOR HIGHER LEVEL LOGIC)

CONSTRUCTION ACCEPTANCE TESTS (cont.)



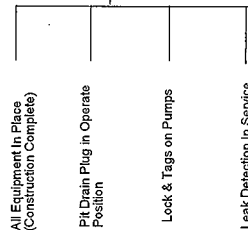
241-AX-B VALVE PIT UPGRADE LOGIC DIAGRAM [cont.]
(SEE TEP FIGURE B-3 FOR HIGHER LEVEL LOGIC)

ACCEPTANCE TEST PROCEDURES



Valve Manifold
and Indicators

OPERATIONAL TEST PROCEDURE



241-AX-B VALVE
PIT OTP

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