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# SPECIFIC TEST AND EVALUATION PLAN

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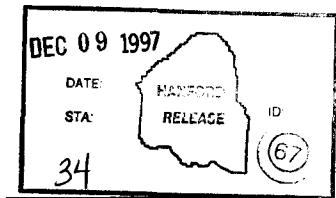
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Abstract: This Specific Test and Evaluation Plan (STEP) defines the test & evaluation activities performed on the 241-AN-A Valve Pit for the W-314 Project.

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**Approved for Public Release**

**PROJECT W-314**  
**SPECIFIC TEST AND EVALUATION PLAN**  
**241-AN-A VALVE PIT**

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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-AN-A 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 modifications of the AN-A 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 modifications to the 241-AN-A Valve Pit. 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-AN Tank Farm 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-AN 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 TE, 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-AN-A 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 241-AN-A valve pit work. 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-AN-A VALVE PIT WORK AND TEST BOUNDARIES

WORK ACTIVITY	PROJECT DRAWING	ESSENTIAL DRAWING	LOCK & TAG LOCATION	COMMENTS
Replace existing main breaker with 225 A main breaker in EDS-DP-106	H-14-100937	H-14-030001, sh 1, 10, 11	Distribution Panel EDS-DP-105, BKR 32	
Power feed to Leak Detection Relay Cabinets (A)-231,335 (B)-231,234. Install all conductors and replacement leak detector boxes and conductors prior to this outage. Perform the installation during AN-A construction.	H-14-100937 H-14-100938	H-14-030001, sh 11	Distribution Panel EDS-DP-105, MAIN BREAKER	
Replace existing leak detector cabinets with new leak detector boxes	H-14-100937 H-14-100935 H-14-100938 H-14-100989 H-14-100960	H-14-020801, SH 2 H-2-71921, SH 1,2 H-14-030001, SH 6	DISTRIBUTION PANEL EDS-DP-101, BREAKER 11	All Three existing boxes and the new box can be installed during AN-A construction. AN-B pit leak detector will be temporarily connected to the new box until AN-B construction occurs.
Excavation for electrical equipment and raceway installation. De-energize direct buried heat trace, leak detection, power and position indicator circuits in the excavation area as shown on the following drawings: H-2-71925 sh 2,3, H-2-71930 sh 1,2, H-2-71928.	H-14-100935 H-14-100939 H-14-100939	H-14-030001, sh1 H-14-030001, sh10 H-14-030001, sh11	To be determined based on exact areas to be excavated and results of surface scan.	
<b>EXCAVATION AROUND AN-A VALVE PIT</b>				
Pressure Sources SL-164 (Process Blank @ AN-04A per rig bld) SL-165 (Process Blank @ AN-05A per rig bld) SL-166 (Impor to Distributor @ AN-05A prb) SL-167 (Process Blank @ AN-07A prb) SN-267 (Impor to Pump @ AN-07A prb)	H-14-100933 H-14-100941 H-14-100942	H-14-020801, sh 2		
Electrical Sources Heat Trace SL-164 SL-165 SL-166 SL-167 SN-267	N/A N/A N/A N/A N/A	H-14-030001, sh10 H-14-030001, sh11 H-14-030001, sh11 H-14-030001, sh10 H-14-030001, sh10	DISTRIBUTION PANEL EDS-DP-105, BREAKER 25 DISTRIBUTION PANEL EDS-DP-106, BREAKER 35 DISTRIBUTION PANEL EDS-DP-106, BREAKER 35 DISTRIBUTION PANEL EDS-DP-105, BREAKER 31 DISTRIBUTION PANEL EDS-DP-105, BREAKER 31	
Leak Detectors LDE-VP-ANA (LDE-113)	N/A	H-14-020801, SH 2 H-2-71931, SH 1 H-14-030001, SH 6	DISTRIBUTION PANEL EDS-DP-101, BREAKER 11	De-energize leak detector, disconnect probe cable, install pumps in place of probe connections, and re-energize leak detector circuit. (ECN Required)
Limit Switches LS-VP-AN-A1 (ZS-101)	N/A	H-14-030001, sh 6	DISTRIBUTION PANEL EDS-DP-101, BREAKER 6	ECN required to H-2-71927, sh 3 and H-2-71925, sh 2 to show removal of this limit switch.
MISCELLANEOUS Depending on the limits of excavation, AN-105 SHMS (VTP-PN1-105E) may need to be de-energized.	N/A	H-14-030001, sh 11	DISTRIBUTION PANEL EDS-DP-105, BREAKER 26	

WORK ACTIVITY	PROJECT DRAWING	ESSENTIAL DRAWING	LOCK & TAG LOCATION	COMMENTS
<b>COVER BLOCK REMOVAL AND INTERNAL PIT WORK</b> Pressure Sources SL-154 (Process Blank @ AN-04A per rtg b/d) SL-155 (Process Blank @ AN-05A per rtg b/d) SL-156 (Amp to Distributor @ AN-05A p/b) SL-157 (Process Blank @ AN-07A p/b) SN-266 (Process Blank @ AN-04A per rtg b/d) SN-265 (Process Blank @ AN-05A per rtg b/d) SN-266 (Imptr to SN-105 PUMP @ AN-06A p/b) SN-267 (Imptr to Pump @ AN-07A p/b)	H-14-100933 H-14-100941 H-14-100942	H-14-020801, sh 1, 2	Motor Control Center: EDS-MCC-101, CUBICLE 04 (CKT 113) Motor Control Center: EDS-MCC-101, CUBICLE 05 (CKT 114)	Pump has an admin lock (IP-1266) also.
Flush Line to nozzle L17		H-14-021801, sh 1	Lock & Tag valves V-133 & V-135 to the Drain Position	Admin lock on pumps feeding SL-160 in AZ-02A.
SL-158 (Tie to AN-B Pit)		H-14-020801, sh 2	Lock & Tag valve V-112 in the R3-V-110 position (Nozzle R-18 blocked)	Admin lock on pumps feeding SN-160 in AZ-02B and AN-101 pump.
SN-208 (Tie to AN-B Pit)		H-14-020801, sh 2	Lock & Tag valve V-114 in the R2-R-15 position (Nozzle R-19 blocked)	
Electrical Sources LOE-VP-ANA-A (LDE-113)	NA	H-14-020801, SH 2 H-2-71921, SH 1 H-14-030091, SH 6	DISTRIBUTION PANEL EDS-DP-101, BREAKER 11	De-energize leak detector, disconnect probe cable, install jumpers in place of probe connections, and re-energize leak detector circuit. (ECN Required)
Limit Switches LS-VP-AN-A1 (ZS-101)	NA	H-14-030091, sh 6	DISTRIBUTION PANEL EDS-DP-101, BREAKER 6	ECN required to H-2-71927, sh 3 and H-2-71925, sh 2 to show removal of this limit switch.
Hydro Test Jumper L1-(H)	H-14-100948	NA	SHOP HYDRO	
Hydro Test Jumper L3-LS-(A&B)	H-14-100949	NA	SHOP HYDRO	
Hydro Test Jumper L20A-DRAIN	H-14-100957	NA	SHOP HYDRO	
Hydro Test Jumper L20-(A)	H-14-100954	NA	SHOP HYDRO	
Hydro Test Jumper L7-9-(B&C)	H-14-100950	NA	SHOP HYDRO	
Hydro Test Jumper L11-(D)	H-14-100951	NA	SHOP HYDRO	
Hydro Test Jumper L11A-DRAIN	H-14-100956	NA	SHOP HYDRO	
Hydro Test Jumper L14-L15-L16-(D&E)	H-14-100952	NA	SHOP HYDRO	
Hydro Test Jumper L19-(E,F,G,H)	H-14-100953	NA	SHOP HYDRO	
Hydro Test Jumper L21-(F)	H-14-100955	NA	SHOP HYDRO	
Hydro Test Jumper L21A-DRAIN	H-14-100958	NA	SHOP HYDRO	

WORK ACTIVITY	PROJECT DRAWING	ESSENTIAL DRAWING	LOCK & TAG LOCATION	COMMENTS
<p>3" Jumper Leak Test</p> <p>SN-267 (Jmpr to Pump @ AN-07A p/b)</p> <p>SN-266 (Jmpr to SN-106 PUMP @ AN-06A p/b)</p> <p>SN-264 (Process Blank @ AN-04A per rtg b/d)</p> <p>SN-265 (Process Blank @ AN-05A per rtg b/d)</p> <p>AN-B valve pit</p> <p>AN-A valve positions:</p> <p>WT-V-311 AS REQUIRED BY TEST PROC.</p> <p>WT-V-312 AS REQUIRED BY TEST PROC.</p> <p>WT-V-313 AS REQUIRED BY TEST PROC.</p> <p>WT-V-314 AS REQUIRED BY TEST PROC.</p> <p>WT-V-315 AS REQUIRED BY TEST PROC.</p> <p>WT-V-316 AS REQUIRED BY TEST PROC.</p> <p>WT-V-317 AS REQUIRED BY TEST PROC.</p> <p>WT-V-318 AS REQUIRED BY TEST PROC.</p> <p>WT-V-319 AS REQUIRED BY TEST PROC.</p> <p>WT-V-320 AS REQUIRED BY TEST PROC.</p> <p>WT-V-321 AS REQUIRED BY TEST PROC.</p> <p>WT-V-322 AS REQUIRED BY TEST PROC.</p> <p>WT-V-323 AS REQUIRED BY TEST PROC.</p> <p>WT-V-802 AS REQUIRED BY TEST PROC.</p>	<p>H-14-100841</p>	<p>H-14-020801, sh 1,2</p> <p>H-14-030001, sh 1</p>	<p>Motor Control Center: EDS-MCC-101, CUBICLE D4 (CKT 113 Pump 106), CUBICLE D5 (CKT 114 Pump 107)</p> <p>Valve in AN-107 pump sampler procedurally controlled in the block position. Lock and Tag not used on the valve to allow positioning for drain after test and relief of trapped air prior to test.</p> <p>Maintain lock on valve V-114 if jumper is still in place. If jumper has been removed, install process blank with drain on nozzle R-19.</p> <p>Install flex jumper from nozzle L17 to nozzle G for leak testing and future flushing. Leave Jumper in place after testing. Connect for test medium at the flush pit hose connection.</p>	

WORK ACTIVITY	PROJECT DRAWING	ESSENTIAL DRAWING	LOCK & TAG LOCATION	COMMENTS
<p><b>2" Jumper Leak Test</b></p> <p>AN-106 PUMP</p> <p>SL-166 (Jmpr to Distributor @ AN-06A pit)</p> <p>SL-164 (Process Blank @ AN-04A per fig b-d)</p> <p>SL-165 (Process Blank @ AN-05A per fig b-d)</p> <p>SL-167 (Process Blank @ AN-07A per fig b-d)</p> <p><b>ANA Valve Pit valves:</b></p> <p>WT-V-301 AS REQUIRED BY TEST PROC.</p> <p>WT-V-302 AS REQUIRED BY TEST PROC.</p> <p>WT-V-303 AS REQUIRED BY TEST PROC.</p> <p>WT-V-304 AS REQUIRED BY TEST PROC.</p> <p>WT-V-305 AS REQUIRED BY TEST PROC.</p> <p>WT-V-306 AS REQUIRED BY TEST PROC.</p> <p>WT-V-307 AS REQUIRED BY TEST PROC.</p> <p>WT-V-308 AS REQUIRED BY TEST PROC.</p> <p>WT-V-309 AS REQUIRED BY TEST PROC.</p> <p>WT-V-801 AS REQUIRED BY TEST PROC.</p>	<p>H-14-100941</p>	<p>H-14-020801, sh 1,2</p> <p>H-14-030001, sh 1</p>	<p>Motor Control Center EDS-MCC-101, CUBICLE D4 (CKT 113, Pump 106)</p> <p>Install flex jumper from nozzle L17 to connection C. Supply test medium from flush pit. Disconnect from connector C and replace process blank after completion of test.</p>	
<p><b>Leak Detector Installation</b></p> <p>ANA VALVE PIT LEAK DETECTOR (LDE-331A4B)</p> <p>SN 288 ENCASUREMENT LEAK DETECTOR (LDE-335)</p>	<p>H-14-100937</p> <p>H-14-100989, sh 1</p> <p>H-14-100990, sh 1</p>	<p>H-14-030001, sh 11</p> <p>Breaker 30</p> <p>H-14-030001, sh 11</p> <p>Breaker 29</p>	<p>Hang Lock and Tag on Disconnect on Leak Detection Relay Cabinet AN-A-WT-PNL-331.</p> <p>Hang Lock and Tag on Disconnect on Leak Detection Relay Cabinet AN-A-WT-PNL-335.</p>	
<p><b>Valve Position Indication Test</b></p>	<p>H-14-100987</p>	<p>None</p>	<p>No Electrical boundaries. Mechanically valve must be available to be cycled full stroke. This test will be included as part of the final OTP.</p>	
<p><b>OTP BOUNDARIES</b></p> <p>Pumps are locked out so that no waste may be transferred. Isolation from AN-B pit is maintained to ensure waste is not released during valve manipulations during OTP.</p> <p>Leak detectors will be energized during the performance of the OTP.</p>	<p>H-14-100937</p> <p>H-14-100941</p> <p>H-14-100969</p> <p>H-14-100975</p> <p>H-14-100984</p> <p>H-14-100987</p> <p>H-14-100989</p> <p>H-14-100990</p>	<p>H-14-020801, sh 1</p> <p>H-14-020801, sh 2</p> <p>H-14-030001, sh 1</p> <p>H-14-030001, sh 11</p> <p>H-2-71931, sh 1</p> <p>H-2-71931, sh 2</p> <p>H-2-71927, sh 3</p> <p>H-2-69095, sh 5</p>	<p>Motor Control Center EDS-MCC-101, CUBICLE D4 (CKT 113, Pump 106)</p> <p>Motor Control Center EDS-MCC-101, CUBICLE D5 (CKT 114, Pump 107)</p> <p>Maintain lock on valve V-114 (AN-B valve pit) if jumper is still in place. If jumper has been removed, install process blank with draw on nozzle R-19.</p>	

#### 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-AN-A Valve Pit modification 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 241-AN-A Requirements Verification Report (RVR), HNF-1534, 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 241-AN-A Valve Pit 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 modification of 241-AN-A Valve Pit. Note that acceptance criteria are included in the individual drawings, specifications, procedures, and CWPs.

TABLE 7-2

COMMERCIAL GRADE ITEM DEDICATION ACTIVITIES					
TEST NUMBER	TEST NAME	REFERENCE DOCUMENT	LOCATION	TEST DOCUMENT	INTERDEPENDENCIES
1.4.C.A.CG.1	Rebar Tensile Test and Physical Inspection	W-314-C1, section 03300, 1.5.2.2;	Shop		Test reports must be in place prior to installing any Rebar.
1.4.C.A.CG.2	Steel Plate, bar and shape Tensile test and physical Inspection	W-314-C1, 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.C.A.CG.3	Commercial Grade Dedication for instrumentation	W-314-C1, 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.C.A.CG.4	Commercial Grade Dedication for Piping Materials, verify pipe size	W-314-C1, 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.

## 7.3 Factory Acceptance Testing

The following table lists the FATs that will be performed to modify 241-AN-A Valve Pit. Note that acceptance criteria are included in the individual drawings, specifications, procedures, and CWPs.

TABLE 7-3

FACTORY ACCEPTANCE TESTS					
TEST NUMBER	TEST NAME	REFERENCE DOCUMENT	LOCATION	TEST DOCUMENT	INTERDEPENDENCIES
1.4.C.A.F.1	Hydro and Leak tests	W-314-P1, section 3.9	Factory		Prior to shipping
1.4.C.A.F.2	Impact Wrench Assembly	W-314-P2, section 3.6	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. All inspection activities performed during construction are referenced in "ACCEPTANCE INSPECTION PLAN", W-314-C1-1, REV. B. Note that acceptance criteria are included in the individual test drawings, specifications, procedures, and CWPs.

TABLE 7-4

CONSTRUCTION ACCEPTANCE TESTS					
TEST NUMBER	TEST	REFERENCE DOCUMENT	LOCATION	TEST DOCUMENT	INTERDEPENDENCIES
1.4.C.A.C.1	In-Place Density Test	W-314-C1, section 02220, 3.1.6.2	Field	CWP	Required prior to excavation for all excavations
1.4.C.A.C.2	Backfill Density Test	W-314-C1, section 02220, 3.3, 3.4, 3.6.1; RVR App.A 3.3.1.6, 3.3.1.7	Field	CWP	During & after backfill
1.4.C.A.C.3	Concrete Slump Test	W-314-C1, section 03300, 1.5.2.1, 3.4.1; RVR App A 3.3.14, App.B 3.3.4.2	Field	CWP	During concrete placement
1.4.C.A.C.4	Concrete Air Content Test	W-314-C1, section 03300, 1.5.2.1; RVR App.A 3.3.14, App.B 3.3.4.2	Field	CWP	During concrete placement
1.4.C.A.C.5	Concrete Test Cylinders	W-314-C1, section 03300, 1.5.2.1; RVR App.A 3.3.14, App.B 3.3.4.2	Field, Lab	Testing Agency Report	Cast cylinders during concrete placement
1.4.C.A.C.6	Concrete Preplacement Inspections	W-314-C1, 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.C.A.C.7	Concrete Placement Inspections	W-314-C1, section 03300, 3.2 & 3.4.2	Field	CWP	During concrete placement
1.4.C.A.C.8	Concrete Post-Placement Inspections	W-314-C1, section 03300, 3.2, 3.3 & 3.4.2	Field	CWP	Prior to Cover block installation.
1.4.C.A.C.9	Expansion Anchor Inspections	W-314-C1, section 05055, 3.4.1	Field	CWP	During anchor installation
1.4.C.A.C.10	Structural Weld Examinations	W-314-C1, section 05500, 3.4.1	Shop, Field	CWP	Prior to coating any structural pieces.
1.4.C.A.C.11	Special Protective Coating Surface Preparation Inspection	W-314-C1, section 09855, 3.2.2 & 3.4.2; RVR App.D 3.3.1.2.1	Shop, Field	CWP	Prior to application of coatings
1.4.C.A.C.12	Special Protective Coating Application	W-314-C1, section 09855, 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.C.A.C.13	Cover Block Painting Diagrams	W-314-C1, 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 drawings referenced in section 3.3.6.
1.4.C.A.C.14	Wiring Continuity	W-314-C1, section 13440, 3.2.1.1 & section 16400, 3.3.1.1	Shop, Field	CWP	Complete prior to performing ATP.
1.4.C.A.C.15	Shielding Resistance to Ground	W-314-C1, section 13440, 3.2.1.2	Field	CWP	Complete prior to performing ATP
1.4.C.A.C.16	Voltage Verification	W-314-C1, section 16400, 3.3.1.2	Field	CWP	Prior to energizing equipment.

CONSTRUCTION ACCEPTANCE TESTS					
TEST NUMBER	TEST	REFERENCE DOCUMENT	LOCATION	TEST DOCUMENT	(INTERDEPENDENCIES)
1.4.C.A.C.17	Holiday Testing of Piping Protective Coatings	W-314-C1, section 15493, 3.1.6.3	Field	CWP	Prior to Backfill.
1.4.C.A.C.18	Welding Non-Destructive Examination	W-314-C1, 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.C.A.C.19	Piping Cleanliness Inspection	W-314-C1, section 15493, 3.2.3.5; RVR App. A 3.3.4	Shop Field	CWP	Prior to any form of pressure testing
1.4.C.A.C.20	Piping Pressure Tests	W-314-C1, section 15493, 3.2.4; RVR App. A 3.3.1.2	Shop	CWP	Test Nozzle spools prior to installation in the field.
1.4.C.A.C.21	Jumper Pressure Tests	W-314-C1, 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.C.A.C.22	Jumper Fabrication Inspections	W-314-C1, section 15493, Appendix A, 4.2	Shop	CWP	Prior to shop hydro
1.4.C.A.C.23	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.
1.4.C.A.C.24	Leak Detector/Drain Plug Mock-up	HNF-SD-W314-PDS-003, section 4.1.2; RVR App. A 3.7.2.1.1.3, 3.7.2.1.1.4, 3.7.2.1.1.5, App. C 3.2.1.1.4, 3.2.1.1.5, 3.2.1.1.6, 3.2.1.2.1, 3.2.1.2.2, 3.2.1.2.3, 3.2.1.3.1, 3.2.1.3.2, 3.2.1.3.3, 3.2.2.2, 3.2.4.3			Mockup testing must be completed and results approved prior to installation in the field.
1.4.C.A.C.25	Electrical & Instrumentation Configuration & Code Compliance	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.C.A.C.26	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
1.4.C.A.C.27	Cathodic Protection	W-314-C1, section 16640, 3.3.1, 3.3.2	Field	CWP	After nozzle installation and prior to application of protective coating on pipe
1.4.C.A.C.28	Jumper Fit Up & Installation	TWRS Operations Requirement	Field	CWP	TWRS Operations witness jumper fit up, balance, & installation
1.4.C.A.C.29	Cover Block Fit Up & Installation	TWRS Operations Requirement	Field	CWP	TWRS Operations witness jumper fit up, balance, & installation
1.4.C.A.C.30	Load test Cover Block lifting balls & Lifting ball Magnetic Particle Test	W-314-C1, 03300, section 3.2.5	Shop	CWP	Prior to Special Protective Coating Application/Installation. Lifting ball Mag. Particle test must be performed AFTER load test.
1.4.C.A.C.31	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.C.A.C.32	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-AN-A Valve Pit modification and upgrade 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	Cathodic Protection	HNF-SD-W314-PDS-001	Field	Prior to backfill
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
TBD	Impact Wrench Assembly	TVRS Operations Requirement	Shop or Factory or field	Prior to field jumper installation

## 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-1265, "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 241-AN-A 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	<p><b>Architectural:</b> 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.</p>	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	OTP-314-001	All equipment in place,
TBD	<p><b>Valve Operation:</b> 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.</p>		Field	OTP-314-001	All equipment in place. Locks and tags in place to prevent inadvertent transfer of waste.
TBD	<p><b>Leak Detector and Drain plug Operation:</b> 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).</p>	RVR App. A 3.3.5, App. C 3.2.4.4	Field	OTP-314-001	All equipment in place, current calibration of the leak detector and the master pump shutdown system not in alarm.

### 7.7 241-AN-A Valve Pit Test Completion

241-AN-A 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-AN-A Valve Pit ABU (HNF-SD-W314-ABU-002) 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-C1, *Construction Specification for Tank Farm Restoration and Safe Operations AN Valve Pit Upgrades*, Fluor Daniel Northwest, Inc., Richland, Washington.
- W-314-P1, *Procurement Specification Ball Valves AN Valve Pit Upgrades*, Fluor Daniel Northwest, Inc., Richland, Washington.
- W-314-P2, *Procurement Specification Impact Wrench AN Valve Pit 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-1534, Rev. 0, *Requirements Verification Report for AN Valve Pit Upgrades (WBS 1.4.C)*, Fluor Daniel Northwest, Inc., Richland, Washington.
- HNF-SD-W314-ABU-002, Rev. 0, *AN-A 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-C1-1, Rev. B, *Acceptance Inspection Plan*, Fluor Daniel Hanford Corporation, Richland, Washington.

241-AN-A VALVE PIT 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
<b>COMMERCIAL GRADE ITEM DEDICATION ACTIVITIES</b>					
1.4.C.A.CG.1	Rebar Tensile Test and Physical Inspection				
1.4.C.A.CG.2	Steel Plate, bar and shape Tensile test and physical Inspection				
1.4.C.A.CG.3	Commercial Grade Dedication for Instrumentation				
1.4.C.A.CG.4	Commercial Grade Dedication for Piping Materials				
<b>FACTORY ACCEPTANCE TETS</b>					
1.4.C.A.F.1	Hydro and Leak tests				
1.4.C.A.F.2	Impact Wrench Assembly				
<b>CONSTRUCTION ACCEPTANCE TESTS</b>					
1.4.C.A.C.1	In-Place Density Test				
1.4.C.A.C.2	Backfill Density Test				
1.4.C.A.C.3	Concrete Slump Test				
1.4.C.A.C.4	Concrete Air Content Test				
1.4.C.A.C.5	Concrete Test Cylinders				
1.4.C.A.C.6	Concrete Pre-placement Inspections				
1.4.C.A.C.7	Concrete Placement Inspections				
1.4.C.A.C.8	Concrete Post-Placement Inspections				
1.4.C.A.C.9	Expansion Anchor Inspections				
1.4.C.A.C.10	Structural Weld Examinations				
1.4.C.A.C.11	Special Protective Coating Surface Preparation Inspection				

241-AN-A VALVE PIT 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.C.A.C.12	Special Protective Coating Application				
1.4.C.A.C.13	Cover Block Painting Diagrams				
1.4.C.A.C.14	Wiring Continuity				
1.4.C.A.C.15	Shielding Resistance to Ground				
1.4.C.A.C.16	Voltage Verification				
1.4.C.A.C.17	Holiday Testing of Piping Protective Coatings				
1.4.C.A.C.18	Welding Non-Destructive Examination				
1.4.C.A.C.19	Piping Cleanliness Inspection				
1.4.C.A.C.20	Piping Pressure Tests				
1.4.C.A.C.21	Jumper Pressure Tests				
1.4.C.A.C.22	Jumper Fabrication Inspections				
1.4.C.A.C.23	Jumper In service Leak Test				
1.4.C.A.C.24	Leak Detector/Drain Plug Mockup				
1.4.C.A.C.25	Electrical & Instrumentation Configuration & Code Compliance				
1.4.C.A.C.26	Piping Configuration Verification				
1.4.C.A.C.27	Cathodic Protection				
1.4.C.A.C.28	Jumper Fit Up & Installation				
1.4.C.A.C.29	Cover Block Fit Up & Installation				
1.4.C.A.C.30	Load test Cover Block lifting bails & Lifting bail Magnetic Particle Test				
1.4.C.A.C.31	Jumper support leg adjustment				
1.4.C.A.C.32	Final Special Protective Coating inspection of pit & cover block				



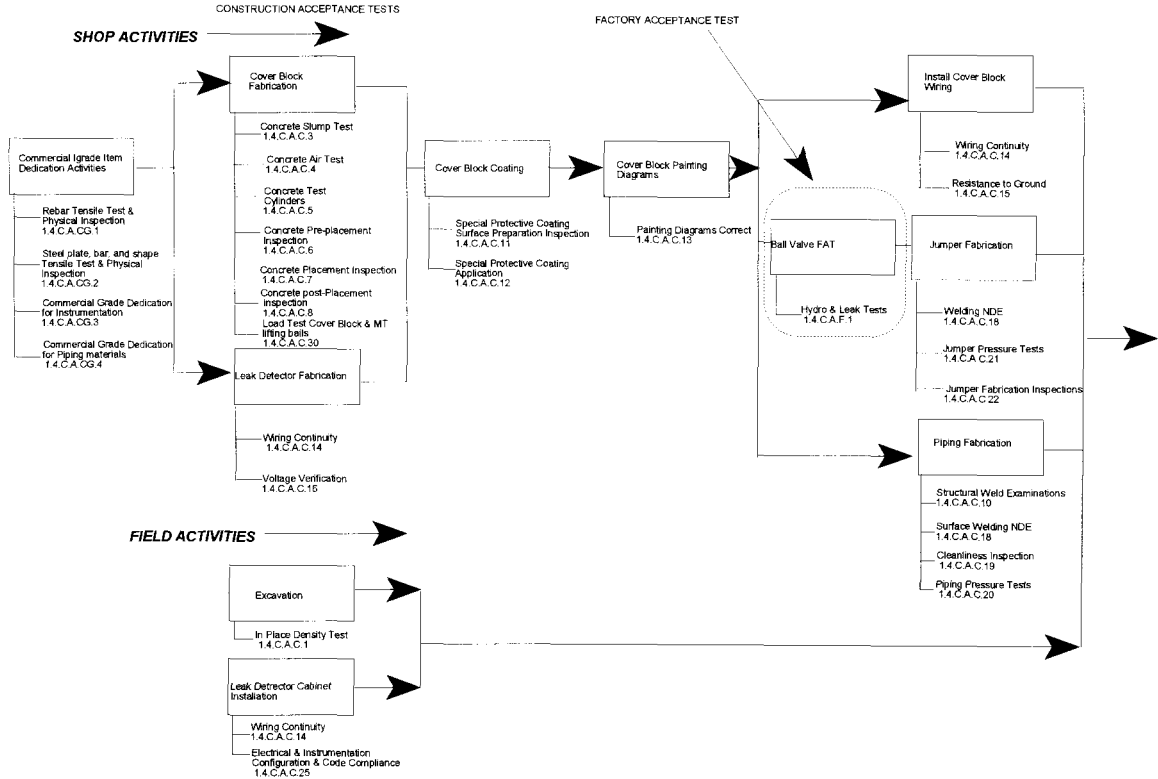
241-AN-A VALVE PIT TEST COMPLETION CHECKLIST

TEST NUMBER	TEST NAME	TEST PROCEDURE/DOCUMENT NUMBER	DATE TEST COMPLETED	TEST COMPLETED AND RESULTS ACCEPTED (i.e., ALL EXCEPTIONS RESOLVED)	
				PRINT NAME	SIGNATURE
<b>ACCEPTANCE TEST PROCEDURES</b>					
TBD	Pit Leak Detection				
TBD	Encasement Leak Detection				
TBD	Cathodic Protection				
TBD	Valve Manifold and Indicators (Position Switches)				
TBD	Impact Wrench Assembly				
<b>OPERATIONAL TEST PROCEDURE</b>					
	<p><b>Architectural:</b> 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.</p>				
	<p><b>Valve Operation:</b> 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.</p>				

241-AN-A VALVE PIT TEST COMPLETION CHECKLIST

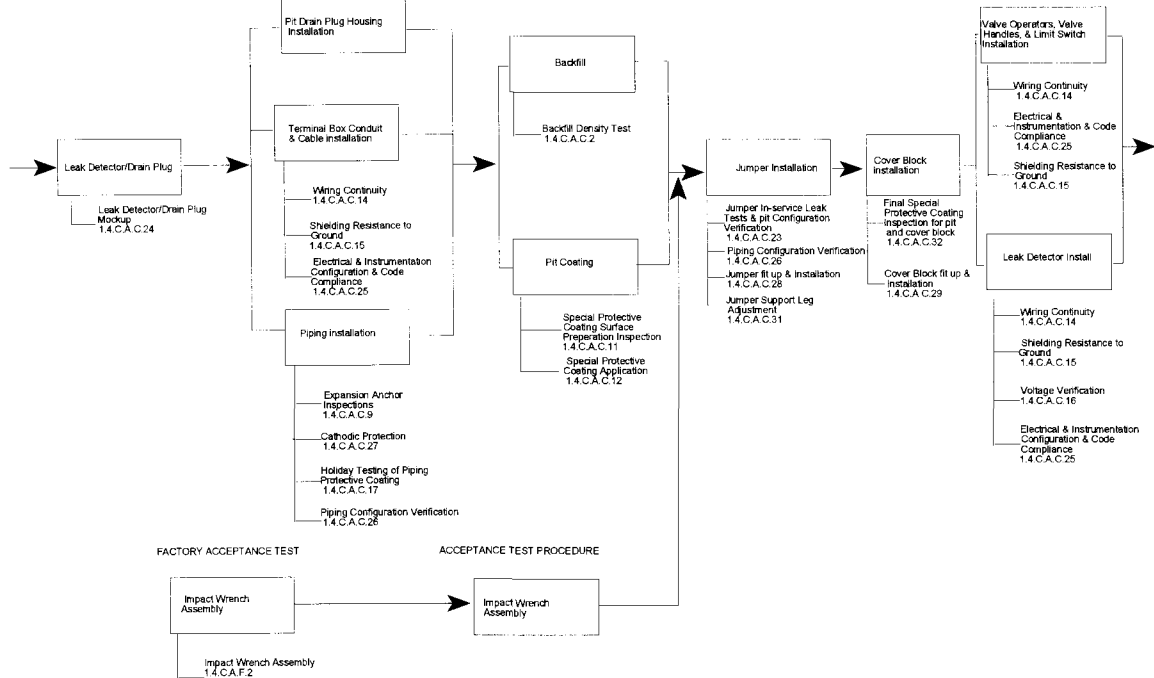
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				PRINT NAME	SIGNATURE
	<p>Leak Detector and Drain plug Operation:                      This section verifies the operation of the leak detector and the drain plug by adding water to the pit until the leak detector actuates the alarms at 271-AN and 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.</p>				

**241-AN-A VALVE PIT LOGIC DIAGRAM**  
 (SEE TEP FIGURE B-3 FOR HIGHER LEVEL LOGIC)



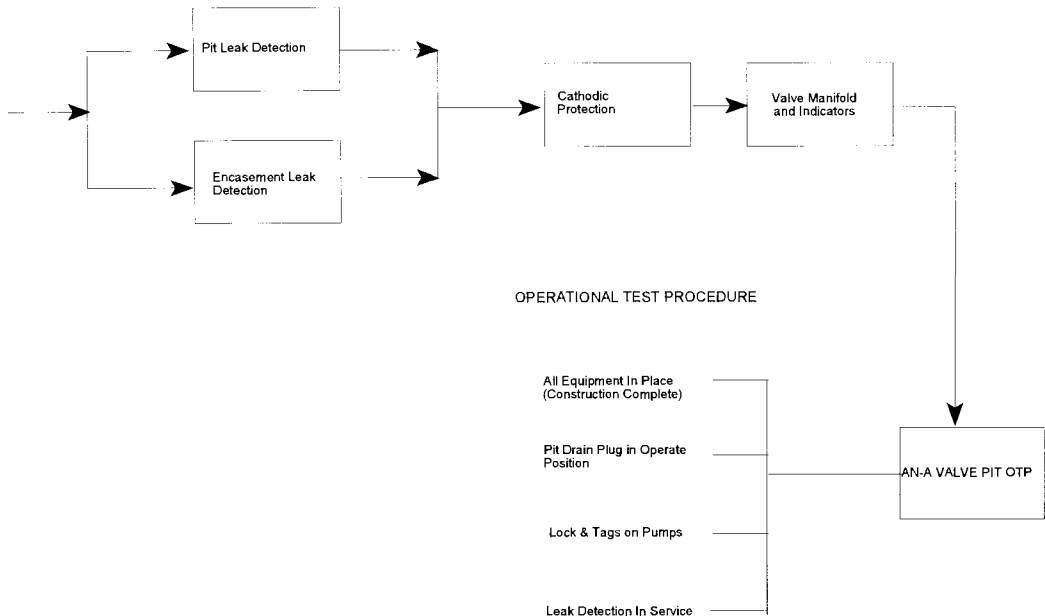
241-AN-A VALVE PIT LOGIC DIAGRAM [cont.]  
 (SEE TEP FIGURE B-3 FOR HIGHER LEVEL LOGIC)

CONSTRUCTION ACCEPTANCE TESTS (cont.)



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

ACCEPTANCE TEST PROCEDURES



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