Pressure Testing of Pipe-In-Pipe Encasements

Tank Farm Plant Operating Procedure

TEST EQUIPMENT

USQ #TF-16-1258-D, Rev. 2

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<tr>
<th>Rev-Mod</th>
<th>Release Date</th>
<th>Justification</th>
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<td>N-6</td>
<td>09/15/2018</td>
<td>Updating Safety Significant PRV EIN</td>
<td>Updated the EIN in multiple locations, updated 4.3.11, and deleted step 4.3.14.</td>
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<tr>
<td>N-5</td>
<td>06/13/2018</td>
<td>WRPS-PER-2018-1044</td>
<td>Added in specific units as it relates to temperature or pressure. Added step to include verify calibrated pressure instrument is set to psig. Updated records section to comply with procedure standard.</td>
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<tr>
<td>N-4</td>
<td>04/04/2018</td>
<td>eDarf request - clarification for documentation of information use only data.</td>
<td>Added to the NOTE before Step 5.1.41 and added “if required” to Step 5.1.42</td>
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<td>N-3</td>
<td>12/19/2017</td>
<td>Operations Request - Based on the revised RPP-TE-58426</td>
<td>Step 4.3.5 For Fiberglass Reinforced Plastic Transfer Lines Air source/supply’s maximum output pressure does not exceed 25.7 psig changed to 38.6 psig</td>
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<td>N-2</td>
<td>12/14/2017</td>
<td>Operations Request - Minor procedure revision needed to support encasement pressure testing of SNL-5350 to support 219-S transfers.</td>
<td>Modified Step 5.1.34 to a conditional statement in ref to PCV-1. Modified note in Figure 1</td>
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1.0 PURPOSE AND SCOPE

1.1 Purpose

This procedure provides instructions to prove integrity of encasements by pneumatic pressure testing to satisfy the requirements of WAC-173-303-640.

1.2 Scope

This procedure provides a method to prove integrity of direct buried pipe-in-pipe encasements by pneumatic pressure testing.

Since the procedure can be used throughout the Tank Farm it was written in a generic nature, and not a stand-alone document. As such, it is intended to be worked in conjunction with an approved work package, with a location specific Job Hazard Analysis (JHA).

This procedure implements Defense-In-Depth controls listed in RPP-13033, Documented Safety Analysis.

HNF-SD-WM-TSR-006, Tank Farms Technical Safety Requirements

2.0 INFORMATION

2.1 Terms and Definitions

- QAT Quality Assurance Technician.
3.0 PRECAUTIONS AND LIMITATIONS

3.1 Personnel Safety

**WARNING** - Loss of system integrity could cause surface and/or personnel contamination. Any leaks encountered downstream from the check valves on the test manifold assembly are potentially contaminated.

**WARNING** - Testing pipe systems requires personnel in the area be notified before applying pressure to system. System must be depressurized prior to breaking pressure boundaries.

3.1.1 Loss of system integrity could cause surface and/or personnel contamination. Any leaks encountered downstream from the check valves on the test manifold assembly are potentially contaminated.

3.1.2 Ensure exclusion zone is set up around pressure test area prior to applying pressure to system.

3.1.3 A safety lanyard will be required on all flexible hose connections that are part of the pressurized system and accessible to personnel.

3.2 Equipment Safety

**CAUTION** - When performing Step 5.1.36 always OPEN valve V-2 then OPEN valve V-1. Always CLOSE valve V-1 then CLOSE valve V-2. This sequencing will prevent potentially over pressurizing the encasement.
3.3 Radiation and Contamination Control

3.3.1 When this procedure is worked in radiological areas, an approved radiological work permit (RWP) is required. If radiological conditions or work performed falls outside the scope of the RWP, all work activities must be discontinued until a new or revised RWP has been issued in accordance with TFC-ESHQ-RP_RWP-C-03.

3.3.2 All planned pressure reduction activities (air) shall be vented into a waste transfer system covered pit or a HEPA filtered vent bottle.

3.3.3 HPT to perform contamination surveys at connection/disconnection locations.

3.3.3.1 Contamination Area (CA) controls are required when performing connections/disconnections.

3.3.3.2 A damp rag as a minimum will be used to contain the breach until verification of contamination levels has been performed. Use of a drape in conjunction with the damp rag is recommended as practical.

3.3.4 All leaks encountered downstream of the double check valves on the test assembly are potentially contaminated until surveys show otherwise.

3.3.5 Grab air sampling at pit covers will be performed during pressure testing and during depressurization.

3.4 Environmental Compliance

3.4.1 Immediately report the following to the Shift Manager. This includes but is not limited to:

- The discovery of spilled or leaked waste outside of normal system boundaries
- Failed encasement leak test
- Inability to cleanup/remove waste spilled or leaked from transfer piping and/or secondary containment within 24-hours of detection
- Primary exhaust ventilation outage.

3.4.2 The following tank farm primary ventilation system equipment must be in operation during performance of this activity:

- Exhauster
- Record sampler
- Stack CAM (if equipped).
3.4 Environmental Compliance (Cont.)

3.4.3 Temporary or permanent pit covers are installed on pits before starting any leak check operation.

3.4.4 HPT coverage will be performed as specified in the Radiological Work Permit and/or Radiological Monitoring Plan.

3.4.5 Post-job survey(s) shall be taken.

3.4.6 Depending on the reason for the pressure test, and unless other arrangements have been made, an Independent, Qualified Registered Professional Engineer (IQRPE) witness may be required. Contact Environmental for guidance on this requirement in accordance with TFC-ESHQ-ENV_PP-C-11.

3.4.7 Report work space air samples to WRPS Environmental Protection and appropriate WRPS Shift Office for grab air samples equal to or greater than 10 DAC within the work space AND/OR contamination found during post job radiological surveillance of the posted and controlled radiological boundary area boundary that exceeds the Radiological Work Plan (RWP).
3.5 Limits

DF 6.1, Waste Transfer Primary Piping Systems

Waste transfer primary piping systems are required to be operable.

- When a compressed air source is connected to the waste transfer primary piping system’s encasement for pneumatic testing of the encasement (i.e., the primary piping within the encasement).

DF 6.7, Compressed Air System Pressure Relieving Devices

When conducting the pneumatic testing, there may be instances where the test fails and the desired pressure is not maintained. After the initial failure to maintain the desired pressure, the following rules apply to subsequent testing:

- When the initial failure is attributable to the encasement and the safety-significant primary pipe remains operable based on available evidence one additional pneumatic test may be performed. If this test fails, then the safety-significant compressed air system pressure relieving devices must be used for any subsequent tests.

- When the initial failure is indeterminate, then safety-significant compressed air system pressure relieving devices must be used for any subsequent tests.
4.0 PREREQUISITES

4.1 Special Tools, Equipment, and Supplies

The following supplies may be needed to perform this procedure:

- Pressure test assembly (Includes ASME code compliant pressure relief valve. calibrated temperature instrument, calibrated pressure gauges and calibrated mass flow meter) (reference RPP-RPT-48016 for steel transfer lines or RPP-STE-60505 for fiberglass transfer lines)
- Pneumatic manifold assembly containing a safety significant pressure relief valve if required
- Cleaning supplies (for contamination control)
- Spill supplies (for contamination control)
- Posting equipment for exclusion zone
- Safety lanyard for pipe/quick disconnects
- Air source/supply
- Waste container
- Snoop or equivalent leak detection liquid
- Other tools, equipment and supplies as identified by Shift Manager/OE/FWS.

4.2 Performance Documents

The following procedures may be needed to perform this procedure:

- TO-100-052, Perform Waste Generation, Segregation, Accumulation and Clean-up
- Work package ________________________________.
4.3 Field Preparations

NOTE - Steps in this section may be performed in any logical order or concurrently.

- Quality Assurance is responsible for verification of steps in this procedure indicated by a QAT signature and date.

- Step 4.3.1 does not apply for depressurizing to tighten leaking mechanical joints unless leaking cannot be stopped.

4.3.1 USE a new copy of this procedure for each test iteration and each line to be pressure tested regardless of the outcome of the test.

4.3.2 SETUP AND POST exclusion zone around pressure test assembly per pre-job requirements.
4.3 Field Preparations (Cont.)

4.3.3 **VERIFY AND RECORD** the following information below:

- Location of process pits and/or diversion boxes
- Nozzle/test riser number or test port location identifier
- Transfer line number(s)
- Transfer line material (e.g. carbon steel, fiberglass reinforced plastic, etc.)
- Pressure test equipment installed (i.e. process blanks, plugs, drain valves, temperature instrument, safety significant PRV, if applicable, etc.)
- Test pressures.

<table>
<thead>
<tr>
<th>LOCATION OF PROCESS PITS AND/OR DIVERSION BOXES</th>
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<table>
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<th>NOZZLE TEST RISER NUMBER OR TEST PORT LOCATION IDENTIFIER</th>
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<th>MINIMUM STARTING TEST PRESSURE (psig)</th>
<th>MAXIMUM STARTING TEST PRESSURE (psig)</th>
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________________________/____________________/________________________
Signature
Engineering
Print (First & Last)
Date

________________________/____________________/________________________
Signature
FWS
Print (First & Last)
Date

________________________/____________________/________________________
Signature
QAT
Print (First & Last)
Date
4.3 Field Preparations (Cont.)

NOTE - Primary transfer line operability is indicated by the transfer line being active in the SECD or by an alternate engineering evaluation.

- Safety Significant PRV, POR570-IA-PRV-001, operability is indicated by the PRV being active in the SECD or by an alternate engineering evaluation.

4.3.4 **VERIFY** primary transfer line is active in the Safety Equipment Compliance Database. *(DF 6.1)*

OR

**VERIFY** that Safety Significant PRV POR570-IA-PRV-001 is active in the Safety Equipment Compliance Database. *(DF 6.7)*

/ / ________________________________  ________________________________
Signature Print (First & Last) Date

Engineering

4.3.5 **VERIFY** the following compressor information based on the type of transfer line being tested:

**For Steel Pipe-in-Pipe Transfer Lines**

- Air source/supply’s maximum output pressure does not exceed 125 psig
- Air source/supply is sized for 185scfm or less at 100 psig.

**For Fiberglass Reinforced Plastic Transfer Lines**

- Air source/supply’s maximum output pressure does not exceed 38.6 psig.
- Air source/supply is sized for 54scfm or less at 12 psig.

/ / ________________________________  ________________________________
Signature Print (First & Last) Date

Engineering
4.3 **Field Preparations (Cont.)**

**NOTE** - Required use of a safety significant pressure relief device is specified in Section 3.5.

- If a safety significant pressure release valve is required, a schematic of the assembly will be included in the work package.

4.3.6 **VERIFY** pressure testing equipment (includes pressure relief valve, calibrated temperature instrument, calibrated pressure gauges, calibrated mass low meter, and safety significant pressure relief valve POR570-IA-PRV-001 if applicable) conforms to schematic of the assembly provided in the work package. Note that if the use of the POR570 manifold containing the safety significant relief valve is required, the additional manifold shall be installed between the air source and the pressure test assembly and/or to Engineering approved equipment as documented on Data Sheet 3.

4.3.7 **VERIFY** encasement drain valves have been positioned per the Work Package.

**NOTE** - Step 4.3.7 is N/A if encasement drain valve is not being used to allow encasement pressurization.

- This procedure is intended to be worked as part of a location specific work package. If a blank/seal is not used the encasement valving will be part of the work package.
4.3 Field Preparations (Cont.)

NOTE - The requirement for the pressure gauge to be between 1½ and 4 times maximum specified test pressure does not apply for electronic digital pressure gauges.

4.3.8 VERIFY the following:
- Pressure gauge calibration is current
- Pressure gauge selected for psig
- Maximum reading of primary pressure gauge is between 1½ and 4 times maximum specified test pressure (N/A for electronic digital pressure gauge).

_____________________________ / __________
Pressure gauge MTE # Cal Due Date

_____________________________ / __________ / __________
Signature Print (First & Last) Date
QAT

4.3.9 VERIFY temperature instrument is rated to operate at temperature ranges up to 300 degrees F and the calibration is current.

Temperature gauge model: __________________________

Calibration date: __________________________

Temperature range: __________________________ °F

_____________________________ / __________ / __________
Signature Print (First & Last) Date
QAT
4.3 Field Preparations (Cont.)

4.3.10 **VERIFY** the following pressure test assembly requirements:
- Has been tested within last 24 months
- Passed test for pressure testing: Date passed ____________________
- Is rated for pressures at least 100% of specified test pressure.

__________________________________/______________________ /
Signature Print (First & Last) Date

4.3.11 **VERIFY** the following pressure relief valve requirements:
- Pressure test assembly PRV is rated to operate at 105 to 110% of specified maximum test pressure.
  
  Actual Pressure Rating ________________ psig
- Pressure test assembly PRV has been tested to verify the set pressure is ≤ 172 psig within last 24 months
  
  Date Tested__________________________.

__________________________________/______________________ /
Signature Print (First & Last) Date

4.3.12 **IF** using a Safety Significant PRV, POR570-IA-PRV-001, **VERIFY** Safety Significant PRV has been tested to verify the set pressure is ≤ 172 psig within last 24 months.

**OR**

**MARK** “N/A” if not using a Safety Significant PRV.

Date Tested__________________________

__________________________________/______________________ /
Signature Print (First & Last) Date
4.3 Field Preparations (Cont.)

4.3.13 VERIFY mass flow meter for the following:

Mass flow meter model/serial number______________________________

Calibration Due Date______________________________

________________________/________________________/___________

Signature Print (First & Last) Date

NOTE - Depending on the reason for the pressure test, and unless other arrangements have been made, an Independent, Qualified Registered Professional Engineer (IQRPE) witness may be required.

4.3.14 CONTACT Shift Manager AND REQUEST Environmental guidance on the need for an IQRPE witness.

☐ IQRPE witness required
☐ IQRPE witness not required

________________________/________________________/___________

Signature Print (First & Last) Date

Environmental

NOTE - Compressed air system PRV POR570-1A-PRV-001 operability is indicated by the compressed air system PRV being active in the SECD or by an alternate engineering evaluation.

- Required use of a safety significant pressure relief device is specified in Section 3.5.

☐ Safety Significant pressure relief device required AND active per Step 4.3.4.
☐ Safety Significant pressure relief device not required per Step 4.3.4.
5.0  PROCEDURE

5.1  Pressure Testing

5.1.1  **HPT PERFORM** pre-job contamination and radiation survey of the work area.

5.1.1.1  **RECORD** RSR number prior to end of shift.

RSR#_______________________  DATE ______________

5.1.2  **VERIFY** all Section 4.3 prerequisites have been completed.

____________________________ / _________________________ / __________________
Signature       Print (First & Last)       Date
FWS

5.1.3  **ENSURE** air source/supply is connected to test manifold.

5.1.4  **IF** utilizing safety-significant PRV POR570-IA-PRV-001, **ENSURE** isolation valve installed within the manifold (e.g., POR570-IA-V-001) is OPEN.

5.1.5  **ENSURE** valve V-1 is CLOSED.

5.1.6  **ENSURE** valve V-2 is CLOSED.

5.1.7  **ENSURE** bleed valve V-3 is CLOSED.

5.1.8  **ENSURE** valve V-4 is OPEN.

5.1.9  **ENSURE** valve V-5 is OPEN.

5.1.10  **ENSURE** valve V-6 is OPEN.

5.1.11  **ENSURE** valve V-7 is CLOSED.

5.1.12  **ENSURE** test manifold is connected to test riser.

5.1.13  **ENSURE** air source/supply outlet valve is OPEN.
5.1 Pressure Testing (Cont.)

5.1.14 REQUEST craft personnel START/STOP air source/supply to support pressurization/stabilization of test pressure.

5.1.15 HPT PERFORM grab air sampling at primary pit covers during encasement pressure testing, unless testing is being conducted on fiberglass transfer lines.

5.1.16 QAT RECORD starting air supply temperature on Data Sheet 1 AND MONITOR temperature until Step 5.1.38 is complete.

**WARNING**
Loss of system integrity could cause surface and/or personnel contamination. Any leaks encountered downstream from the check valves on the test manifold assembly are potentially contaminated.

5.1.17 OPEN valve V-2.

**WARNING**
Testing pipe systems requires personnel in the area be notified before applying pressure to system. System must be depressurized prior to breaking pressure boundaries.

5.1.18 CONFIRM exclusion zone set up and posted per Step 4.3.2.

5.1.19 CYCLE valve V-1 to slowly build pressure in the encasement to 50% of the minimum starting test pressure specified in Step 4.3.3.

5.1.19.1 IF pressure exceeds 50% of the minimum starting test pressure, CYCLE valve V-3 to relieve any excess pressure.
5.1 Pressure Testing (Cont.)

NOTE - Monitoring of temperature is not required once stabilization is reached and the air source/supply has been isolated from the test assembly.

- Step 5.1.20 requires the QAT to be present to facilitate completion of Data Sheet 1.

5.1.20 MONITOR temperature instrument during pressurization to ensure supply air temperature does not exceed 120°F.

5.1.20.1 IF temperature reaches 120°F, STOP pressurization AND PERFORM the following:

a. CLOSE valve V-1.

b. CLOSE valve V-2.

c. CYCLE valve V-3 to relieve any excess pressure.
5.1 **Pressure Testing (Cont.)**

**Identify and Correct Leaks (Steps 5.1.21 through 5.1.28)**

5.1.21 **MAINTAIN** pressure when necessary to check for obvious leaks.

5.1.22 **IF** leak(s) are observed, **NOTIFY** FWS AND **PERFORM** Steps 5.1.23 through 5.1.28 **OTHERWISE GO TO** Step 5.1.29.

5.1.23 **REQUEST** HPT perform survey of leaking area(s).

**NOTE** - All mechanical joints on the pressure test assembly are shop tested and certified. Attempting to tighten pressure test assembly mechanical joints will invalidate certification of the test assembly. Steps 5.1.24 through 5.1.28 apply to leaks anywhere within the test boundaries other than the pressure test assembly (e.g., hose connections, test riser connections, etc.).

5.1.24 **IF** mechanical joints on the test assembly are leaking **PERFORM** the following:

5.1.24.1 **CLOSE** valve V-1.

5.1.24.2 **CLOSE** valve V-2.

5.1.24.3 **CLOSE** valve V-6.

5.1.24.4 **OPEN** valve V-7.

5.1.24.5 **IF** leaks found, **REQUEST** craft personnel fix leak(s).

5.1.24.6 **GO TO** Step 5.1.43.1.
5.1 Pressure Testing (Cont.)

Identify and Correct Leaks (Steps 5.1.21 through 5.1.28) (Cont.)

5.1.25 IF breaking pressure boundaries, **PERFORM** the following:

5.1.25.1 **ENSURE** valve V-1 is CLOSED.

5.1.25.2 **ENSURE** valve V-2 is CLOSED.

5.1.25.3 **SHUTDOWN** air source/supply.

5.1.25.4 **CLOSE** air source/supply outlet valve.

5.1.25.5 **OPEN** valve V-2.

NOTE - During depressurization, valve V-3 may be adjusted to relieve pressure at a controlled rate.

5.1.25.6 **SLOWLY BLEED OFF** pressure to approximately zero using valve V-3.

5.1.25.7 **SLOWLY OPEN** valve V-1.

5.1.25.8 **REQUEST** craft personnel fix leak(s).

5.1.26 **AFTER** air flow has stopped **PERFORM** the following:

5.1.26.1 **CONFIRM** pressure gauge at test manifold is reading approximately zero.

5.1.26.2 **CLOSE** valve V-3.

5.1.26.3 **CLOSE** valve V-1.

5.1.26.4 **CLOSE** valve V-2.
5.1 Pressure Testing (Cont.)

Identify and Correct Leaks (Steps 5.1.21 through 5.1.28) (Cont.)

NOTE - Entry into a pit is outside the scope of this procedure and should not occur.

5.1.27 IF leak is inside pit, PERFORM the following:

5.1.27.1 PERFORM general area contamination survey of pit cover openings and accessible areas near pit.

5.1.27.2 INFORM FWS immediately of leak and survey results.

5.1.27.3 ENSURE valve V-1 is CLOSED.

5.1.27.4 ENSURE valve V-2 is CLOSED.

5.1.27.5 GO TO Step 5.1.43.1.

5.1.28 WHEN identified leaks have been corrected, PERFORM one of the following:

5.1.28.1 IF air source/supply was shut down and system was depressurized GO TO Step 5.1.3 to re-pressurize encasement, OR

IF air source/supply is operating and the system is pressurized GO TO Step 5.1.29.
Pressure Testing of Pipe-In-Pipe Encasements

5.1 Pressure Testing (Cont.)

Pressure Test Encasement (Steps 5.1.29 through 5.1.41)

5.1.29 ENSURE valve V-2 is OPEN.

5.1.30 ENSURE valve V-6 is OPEN.

5.1.31 CLOSE valve V-7.

5.1.32 CYCLE valve V-1 to slowly build pressure in the encasement to test pressures specified in Step 4.3.3.

5.1.32.1 IF pressure reaches maximum test pressures specified in Step 4.3.3 CYCLE valve V-3 to relieve any excess pressure.

5.1.33 WHEN test pressure specified in Step 4.3.3 is reached, PERFORM the following:

5.1.33.1 CLOSE valve V-1.

5.1.33.2 CLOSE valve V-2 to isolate air source/supply.

5.1.34 IF pressure control valve PCV-1 is installed, ENSURE it is controlling to test value specified in Step 4.3.3.

5.1.35 IF requested by ENG/FWS to establish initial flow rate, PERFORM the following:

5.1.35.1 CLOSE valve V-5.

5.1.35.2 OPEN valve V-7.

5.1.35.3 ESTABLISH flow rate for information only.

5.1.35.4 OPEN valve V-5.

5.1.35.5 CLOSE valve V-7.
5.1 Pressure Testing (Cont.)

CAUTION
When performing Step 5.1.36 always OPEN valve V-2 then OPEN valve V-1. Always CLOSE valve V-1 then CLOSE valve V-2. This sequencing will prevent potentially over pressurizing the encasement.

NOTE - Stabilized is defined as the test pressure remaining within test parameters as specified in Step 4.3.3 for a minimum of 30 minutes without valve manipulation.

5.1.36 MAINTAIN test pressure by cycling valves V-1, V-2, and V-3 until pressure has stabilized.

5.1.37 IF test pressure does not stabilize after 30 minutes, PERFORM the following:

- 5.1.37.1 NOTIFY Engineering.
- 5.1.37.2 SECURE system per Steps 5.1.43 through 5.1.43.9 THEN, EXIT this procedure.

5.1.38 QAT AFTER test pressure stabilizes, STOP temperature monitoring AND RECORD ending temperature and date/time on Data Sheet 1.

5.1.39 CLOSE valve V-5.

5.1.40 OPEN valve V-7.

NOTE - The minimum and maximum starting test pressures are specified in Step 4.3.3. Acceptance criteria is based upon not greater than a 5% pressure drop calculated using the starting test pressure.

- Recording of flow rates is only required when requested by Engineering. Recording of pressure during testing is always required.

<table>
<thead>
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<th>LEAK INDICATION CRITERIA</th>
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<tr>
<td>ENCASEMENTS</td>
</tr>
<tr>
<td>TIME DURATION STARTS WHEN TEST PRESSURE INITIALLY BECOMES STABLE</td>
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</tbody>
</table>

5.1.41 RECORD the following:
- Starting time
- Initial pressure.
5.1 Pressure Testing (Cont.)

5.1.42 RECORD pressure and flow rates, if required, at the intervals identified on Data Sheet 2 – Test Data Pressure Readings:

5.1.42.1 IF pressure decreases during test by more than 5% of the starting test pressure AND

IF it is the first test attempt, PERFORM the following:

a. REQUEST Engineering DOCUMENT evidence that primary pipe remains operable on Data Sheet 3.

b. GO TO Step 5.1.29 to re-perform test. (DF 6.7)

5.1.42.2 IF pressure decreases during test by more than 5% of the starting test pressure AND

IF it is not the first test attempt, PERFORM the following:

a. IF directed by FWS/Engineering to re-perform test, ENSURE safety significant PRV is installed in the pressure test equipment setup as specified in Step 4.3.6 AND

   GO TO Step 5.1.29.

b. IF directed by FWS/Engineering, STOP testing AND

   GO TO Step 5.1.43.
5.1 Pressure Testing (Cont.)

5.1.43 WHEN pressure test is complete

OR

WHEN directed by Shift Manager/Engineering PERFORM the following:

5.1.43.1 IF not already done SHUTDOWN air source/supply AND

CLOSE discharge valve.

5.1.43.2 CLOSE valve V-6.

5.1.43.3 OPEN valve V-5.

NOTE - During depressurization, valve V-3 may be adjusted to relieve pressure at a controlled rate.

5.1.43.4 SLOWLY OPEN valve V-3 to relieve system pressure.

5.1.43.5 OPEN valve V-1.

5.1.43.6 SLOWLY OPEN valve V-2.

WARNING

Testing pipe systems requires personnel in the area be notified before applying pressure to system. System must be depressurized prior to breaking pressure boundaries.

5.1.43.7 AFTER air flow has stopped CONFIRM pressure gauges at test manifold are reading approximately zero.

5.1.43.8 REMOVE exclusion zone boundaries.

5.1.43.9 HPT SECURE grab air sampling upon system depressurization.
5.1 Pressure Testing (Cont.)

5.1.44  HPT **PERFORM** post-job radiation and contamination survey of the work area **AND**

**ENSURE** the survey includes the following:

5.1.44.1  HPT **PERFORM** general area contamination survey of pit cover openings and accessible areas near pit.

5.1.44.2  **PERFORM** radiological survey of test equipment.

5.1.44.3  **RECORD** RSR number prior to end of shift.

RSR#___________________  DATE ______________
5.2 Records

5.2.1 PERFORM the following for records identified within this procedure.

5.2.1.1 On the Records Submittal Checklist, RECORD the number of times the record was generated in applicable column

OR

PLACE a check mark (✓) in the N/A column.

5.2.1.2 SUBMIT the package for verification of completed records.
5.2 Records (Cont.)

<table>
<thead>
<tr>
<th>Records Submittal Checklist</th>
<th>Number of times completed</th>
</tr>
</thead>
</table>

**Section 4.3 Field Preparations**

<table>
<thead>
<tr>
<th>Step 4.3.3</th>
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<tbody>
<tr>
<td>Step 4.3.4</td>
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<td>Step 4.3.14</td>
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</tbody>
</table>

**Section 5.0 PROCEDURE**

| Step 5.1.2 | |

**Addenda**

| Data Sheet 1 – Air Source/Supply Temperature | |
| Data Sheet 2 – Test Data Pressure Readings | |
| Data Sheet 3 – Encasement Testing Information Record Sheet | |
| Signature Sheet 1 | |

_________________________/_________________________/_________________________
Signature   Print (First & Last)     Date
Shift Manager/OE

The record custodian identified in the Company Level Records Inventory and Disposition Schedule (RIDS), is responsible for record retention in accordance with TFC-BSM-IRM_DC-C-02.
### Pressure Testing of Pipe-In-Pipe Encasements

#### Data Sheet 1 – Air Source/Supply Temperature

<table>
<thead>
<tr>
<th>Waste Transfer Line Number</th>
<th>START TIME</th>
<th>TEST DATA TEMPERATURE READINGS</th>
<th>END TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Start</td>
<td>End</td>
<td></td>
</tr>
<tr>
<td>TEMPERATURE (°F)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>QAT INITIALS</td>
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<td></td>
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</tbody>
</table>

Temperature remained below 150°F (Circle one)  
Yes / No

____________________ / ___________________ / ___________________
Signature               Print (First & Last)       Date

QAT
# Pressure Testing of Pipe-In-Pipe Encasements

## Data Sheet 2 – Test Data Pressure Readings

<table>
<thead>
<tr>
<th>Waste Transfer Line Number</th>
<th>START TIME</th>
<th>TEST DATA (PRESSURE RREADINGS AND FLOW RATE)</th>
<th>END TIME¹</th>
<th>Initials</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Start</td>
<td>+ 5 MIN.</td>
<td>+ 10 MIN.</td>
<td>+ 15 MIN.</td>
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<tr>
<td>Pressure (psig)</td>
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<td>Flow Rate (scim)</td>
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<td></td>
<td>Circle one</td>
<td>Pass / Fail</td>
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</table>

- A 5% drop can result in an acceptable test pressure which is lower than the minimum starting test pressure.

---

¹ End time is 30 minutes after Start Time.

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_________________________ / ___________________________/ ___________________________
Signature                      Print (First & Last)                          Date

QAT
## Data Sheet 3 – Encasement Testing Information Record Sheet

<table>
<thead>
<tr>
<th>Date/Time</th>
<th>Record Encasement Testing information.</th>
<th>Page</th>
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FWS Review:

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**Type**: CONTINUOUS  
**Document No.**: TO-140-170  
**Rev/Mod**: N-6  
**Release Date**: 09/15/2018  
**Page**: 31 of 33
Pressure Testing of Pipe-In-Pipe Encasements

Figure 1 – Test Equipment Arrangement for Pipe-In-Pipe Encasements (Typical)

Note – Pressure test assembly shall be per RPP-RPT-48016, Appendix A for steel pipe-in-pipe encasement test. Pressure test assembly shall be per RPP-STE-60505, Attachment 1 for fiberglass reinforced plastic pipe-in-pipe encasement tests. Encasement configuration and method of connection may not match Figure 1.
Signature Sheet 1

All persons participating in performance of this procedure shall enter their printed name, signature and initials below.

<table>
<thead>
<tr>
<th>Name (Printed (First &amp; Last))</th>
<th>Signature</th>
<th>Initials</th>
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