Clean Level-Indicating Transmitter Tapes, Plummets, and Displacers

Tank Farm Plant Operating Procedure

USQ # TF-18-1208-D, Rev. 0

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CHANGE HISTORY (≤ LAST 5 REV-MODS)

<table>
<thead>
<tr>
<th>Rev-Mod</th>
<th>Release Date</th>
<th>Justification</th>
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<tr>
<td>K-6</td>
<td>07/31/2018</td>
<td>Operations Request</td>
<td>Update Record Section. Updated Rad Con Section. Added warning to Safety Section. Removed reference to Site form A-6003-131. Added (First &amp; Last) to comment sheet.</td>
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<td>K-5</td>
<td>06/11/2018</td>
<td>Operations Request</td>
<td>Changed the Instructions on Data Sheet 1 - Routine Liquid Level Flush Data Sheet to read as follows: Special Instructions: SM/OE UPDATE in Tank Addition eTool (TADD) AND SEND completed copies to mailbox &quot;Process Engineering &amp; Environmental.&quot; Struck out &quot;Time flush started&quot;</td>
</tr>
<tr>
<td>K-4</td>
<td>02/15/2018</td>
<td>Operations Request</td>
<td>Revise to allow for flushing of annulus Enraf. Changes to Scope, Field Preparation, adding document references needed to work in annulus, and entries into DS 1 if activity is performed in the annulus rather than the primary tank.</td>
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<td>K-3</td>
<td>02/12/2018</td>
<td>Operations Request</td>
<td>Update Data Sheet to include Instruction: SCAN and SEND completed Data Sheet to &quot;Process Engineering &amp; Environmental&quot; mailbox</td>
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<td>K-2</td>
<td>12/27/2017</td>
<td>Operations request</td>
<td>In general: Additional changes streamline work flow deleting need for Data Sheet 2 and Signature Sheet 1. Minor tweaking in Sections 5.1 and 5.2 to make it flow better. In Section 5.3 - Deleted Steps 5.2.3, 5.3.8 and sub-step 5.2.3.1, 5.3.8.1 thru 5.3.8.4. Moved steps 5.3.10.1 and 2 up from lower step. Deleted Step 5.3.16. Steps 5.3.19.1 and 2 were moved from next step</td>
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Type | Document No. | Rev/Mod | Release Date | Page |
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# Clean Level-Indicating Transmitter Tapes, Plummets, and Displacers

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1.0 PURPOSE AND SCOPE

1.1 Purpose

This procedure provides instructions for flushing Tank Farm manual tapes and Enraf 854 ATG level gauges.

1.2 Scope

This procedure applies to flushing Tank Farm manual tapes and Enraf 854 ATG level gauges, including annulus Enrafs.

Flushing manual tapes that do not have a flush connection is beyond the scope of this procedure.

2.0 INFORMATION

2.1 Terms and Definitions

- Displacer and wire - ENRAF level transmitting components.
- Enraf - Enraf is division of the Honeywell Corporation, however in this procedure the term Enraf is used for the Enraf 854 ATG level gauge.
- LIT - Level Indicating Transmitter
- SST – Single Shell Tank
- DST – Double Shell Tank
- EIN – Equipment Identification Number.
- LDT – Leak Detection Transmitter.

In this procedure when steps apply to manual tapes and/or Enrafs, the term(s) “displacer or plummet” and “wire or tape” are used as generic descriptions for Enraf displacers and wires as well as manual tape plummets and tapes.

Experience has shown Level Indicator performance is improved with occasional plummet flushing. (Frequency of flushing is based on operating experience and/or engineering evaluations and will vary from Indicator to Indicator.)
3.0 PRECAUTIONS AND LIMITATIONS

3.1 Personnel Safety

**WARNING** - If flushing is being performed with hot water, contact with thermally un-insulated flush water system piping and components can result in burns.

**WARNING** - Plummets/tapes may be contaminated with tank waste. Raising them may cause increasing radiation levels.

3.1.1 Hearing protection required when working in close proximity to the flush truck pump when the pump is running.

3.2 Radiation and Contamination Control

3.2.1 When disconnecting, breaching or opening systems or system components that are currently or were previously connected to waste tanks or waste transfer systems:
   - Continuous HPT coverage is required
   - Pre-job and post-job HPT surveys are required
   - A damp rag, as a minimum, will be used to contain the breach until radiological verifications have been performed.

3.2.2 When work is performed in or when work will result in a high contamination, high radiation, or an airborne radioactivity area, an approved work package or technical procedure must be developed which is reviewed by Radiological Control per the ALARA work planning procedure TFC-ESHQ-RP_RWP-C-03.

3.2.3 If procedure is to be used as a stand-alone document, Radiological Control shall assign RWP to be used.

3.2.4 Continuous HPT monitoring is required while plummets are being raised. If exposure rates approach the RWP limits while raising plummets, work shall be stopped to prevent excessive exposure.
3.3 Environmental Compliance

3.3.1 In accordance with TFC-ESHQ-ENV_RM-C-04 and TFC-ESHQ-ENV_RM-C-01, routine maintenance and operation activities may result in small incidental discharge of water as long as the limits and conditions listed below are met.

3.3.2 If discharge is to occur within a soil contamination area or tank farm the following limits and conditions apply:

- Refer to Table 2 of TFC-ESHQ-ENV_RM-C-04 for the listing of approved incidental discharges (for this procedure disconnecting water hose(s) is an approved incidental discharge)
- Actions to minimize the amount of incidental water discharge to soils should be taken.
- No discharge from a single activity may exceed 60 gallons.
- Ponding and erosion is prevented by limiting discharge rates.
- Discharge does not contain added contaminants to the water.

3.3.3 If discharge is to occur outside of a soil contamination area or a tank farm the following limits and conditions apply:

- Approved incidental discharges (for this procedure disconnecting water hose(s) is an approved incidental discharge).
- Actions to minimize the amount of incidental water discharge to soils should be taken.
- Additional requirements are necessary if volume is to exceed 14,500 gallons in a 24-hr period; contact Environmental for guidance and appropriate controls.
- No discharge within 300 feet of a pond, crib, or ditch.
- Ponding and erosion is prevented by limiting discharge rates.
- Instantaneous flow rate of <150 gallons per minute.
- Discharge does not contain added contaminants to the water.
- There is no allowable discharge volume for discharges resulting from operational error.

3.3.4 Environmental must be notified, per the Environmental on call list in the event of a leak during transfer operations in compliance with TFC-ESHQ-ENV_FS-C-01, “Environmental Notification.”

3.3.5 Immediately report any spills and/or releases to Environmental per Environmental-On-Call list in accordance with TFC-ESHQ-ENV_FS-C-01. This includes discharges of water resulting from operational error.
Clean Level-Indicating Transmitter Tapes, Plummets, and Displacers

3.4 Limits

OPERATING SPECIFICATION DOCUMENTS (OSDs)

OSD-T-151-00007, Operating Specifications for the Double-Shell Storage Tanks
OSD-T-151-00013, Operating Specifications for Single-Shell Waste Storage Tanks
OSD-T-151-00031, Operating Specification for the Tank Farm Leak Detection and Single-Shell Tank Intrusion Detection
TFC-OPS-OPER-C-10, Vehicle and Dome Load Control in Tank Farm Facilities

4.0 PREREQUISITES

4.1 Special Tools, Equipment, and Supplies

The following supplies may be needed to perform this procedure:

- Specified portable containment
- Damp rags
- Plastic bags (small and large)
- Water bags (small and large) (water may be hot or cold and potable or raw)
- Water truck with flush tank (water may be hot or cold and potable or raw)
- Water meter (portable or permanent)
- Special flush attachment.
- Hearing protection.

4.2 Performance Documents

The following procedures may be needed to perform this procedure:

- TO-040-180, Operate Tank Surface Level Monitoring Devices
- TO-100-052, Perform Waste Generation, Segregation, Accumulation and Clean-up
- 5-LCD-300, Enraf Series 854 Displacer Weight Check and Calibration Check and Obtain Sediment Levels
- 6-LDD-485, ENRAF Series 854 Annulus Leak Detection Gauges Calibration and Maintenance
- TO-040-590, Leak Detection Wells, Annulus Leak Detection System.
4.3 Field Preparation

NOTE - As used in this procedure, the term “Level Indicator” is a generic term meaning Enraf (including Annulus Enrafs) or manual tape.

NOTE - Steps within this Section 4.3.1 through 4.3.5 may be worked in any logical order.

4.3.1 RECORD the following data on Data Sheet 1 for the level indicator being flushed:

- Date of flush
- Tank number of level device being flushed
- Liquid level device type (Manual Tape or Enraf)
- EIN of liquid level device to be flushed
- Source of water used for flushing liquid level device
- Estimated amount of water to be used for flush
- Maximum allowed water to be used for flush
- Selection of hot or cold water to be used for flush

4.3.2 IF activity is being performed in an annulus, PERFORM the following:

4.3.2.1 REQUEST Shift Manager / OE approve flushing of liquid level device AND

SIGN on Data Sheet 1

4.3.2.2 RECORD N/A for the tank liquid level (before flush) on Data Sheet 1.
4.3 Field Preparation (Cont.)

4.3.3 If activity is being performed in a primary tank, RECORD the current tank liquid level (before flush) on Data Sheet 1.

4.3.3.1 If a current level is not available, RECORD the last known valid level on Data Sheet 1 AND DOCUMENT in comments section.

4.3.3.2 If plummet is stuck to waste or level reading cannot be obtained for any other reason, RECORD reason level reading cannot be obtained on Data Sheet 1 AND MARK unobtainable readings “N/A”.

NOTE - Step 4.3.3.3 does not apply for flush activities to catch tanks.

4.3.3.3 REQUEST Shift Manager/ OE perform the following:

a. CALCULATE anticipated tank level after flush AND RECORD on Data Sheet 1.

b. CONFIRM level will not exceed normal operating limit for tank waste liquid level per OSD-T-151-00007 for DSTs or the allowable deviation from the established baseline per OSD-T-151-00031 for SSTs.

4.3.3.4 REQUEST Shift Manager / OE approve flushing of liquid level device based upon calculated liquid level after flush AND SIGN on Data Sheet 1.

4.3.4 If flushing an SST level Indicator and greater than 100 gallons of flushing water will be required, OBTAIN approval from the Production Operations Engineering Manager on Data Sheet 1. (OSD-T-151-00013)

4.3.5 ENSURE a waste planning checklist is provided with correct waste containers available to perform work activities per procedure TO-100-052.
5.0 PROCEDURE

NOTE - Sections within this procedure may be worked independently or not at all. Sections not performed will be lined out and marked “N/A”.

- As used in this procedure, the term “Level Indicator” is a generic term meaning Enraf or manual tape.
- Hot or cold raw water or hot or cold potable water may be used for flushing.

5.1 Prepare to Flush Level Indicator Plummet

5.1.1 IF directed by FWS, PLACE plastic ground cover around Level Indicator.

5.1.2 IF flush truck will be entering the Tank Farm ENSURE the following:

- It has been properly inspected,
- Has a legible authorization sticker affixed, and
- Has a route map/drawing per the requirements of TFC-OPS-OPER-C-10, “Vehicle and Dome Load Control in Tank Farm Facilities”

5.1.3 NOTIFY Shift Manager/OE before vehicle is moved inside fenced boundaries of Tank Farm.
5.2 Connect Flush Equipment

5.2.1 POSITION flush truck in the best suitable location, or per FWS direction.

**WARNING**
If flushing is being performed with hot water, contact with thermally un-insulated flush water system piping and components can result in burns.

5.2.2 BEFORE proceeding, ENSURE protective gloves have been donned.

NOTE - Refer to Figure 1 thru Figure 3 for flush assembly, hose and connection information.

5.2.3 ENSURE flush assembly valve is CLOSED.

5.2.4 CONNECT flush assembly to flush hose.

5.2.5 CONNECT flush assembly to flush connection on Enraf or manual tape.

5.2.6 ENSURE there is a copy of Data Sheet 1 for each Level Indicator being flushed AND

ENTER the Time flushing is started.
5.3 Flush Level Indicator Plummets

5.3.1 BEFORE proceeding, ENSURE Shift Manager/OE has authorized flush water addition on Data Sheet 1.

5.3.2 IF flushing a SST liquid level device with greater than 100 gallons of water, ENSURE Production Operations Engineering Manager has approved flush activity on Data Sheet 1. (OSD-T-151-00013)

5.3.3 SELECT method water usage will be determined by on Data Sheet 1 (water meter or flush truck tank increments).

5.3.4 RECORD beginning flush tank increment level reading or water meter reading on Data Sheet 1.

5.3.5 IF flushing Densitometer/Enraf at AY-102 Waste Tank Riser-055, ENSURE valve AY102-WST-V-140 is CLOSED.

5.3.6 OPEN flush assembly valve.

5.3.7 START flush truck water pump.
Flush Level Indicator Plummet (Cont.)

5.3.8 IF flushing will be performed without raising plummet, PROCEED with flush using amount of water specified on Data Sheet 1 AND GO TO Step 5.3.19.

Flush Plummet Without Raising it into Level Indicator

5.3.9 BEFORE proceeding, IF an Enraf displacer, or a manual tape plummet, needs to be raised to facilitate flushing, ENSURE a Health Physics Technician is present.

5.3.10 IF plummet is to be flushed without raising it into the sight glass, RAISE plummet approximately four (4) feet in accordance with Step 5.3.10.1 or 5.3.10.2. (“4 feet” has no technical basis but has been determined by Engineering to be a good operating practice.)

5.3.10.1 IF raising Enraf displacer, USE procedure 5-LCD-300, 6-LDD-485, or an approved work package.

5.3.10.2 IF raising manual tape plummet, SLOWLY TURN hand wheel to raise plummet. (“SLOWLY” is at a speed that does not exceed the response rate of the survey instrument)

5.3.11 WHEN amount of water specified on Data Sheet 1 has been flushed, GO TO Step 5.3.19.

Raise Plummet into Sight Glass

**WARNING**

Plummets/tapes may be contaminated with tank waste. Raising them may cause increasing radiation levels, resulting in personnel injury.

5.3.12 ENSURE PPE listed on the RWP has been donned.

5.3.13 ENSURE an HPT is present to perform continuous radiological monitoring.

5.3.14 CHECK radiation levels are within RWP limits.

5.3.15 IF radiation levels approach RWP limits at any time during remainder of this procedure, LOWER plummet back down AND NOTIFY FWS/Shift Manager/OE and Radiological Control Manager.
5.3 Flush Level Indicator Plummet (Cont.)

5.3.16 IF raising Enraf displacer, USE procedure 5-LCD-300, 6-LDD-485, or an approved work package.

5.3.17 IF raising manual tape plummet, SLOWLY TURN hand wheel to raise plummet.

NOTE - Components may be flushed while being moved up or down.

5.3.18 IF components are coated with tank waste as indicated by high dose rate readings, PERFORM a flush while raising (or lowering after raising) until flushing is no longer effective in reducing dose rate,

OR

WHEN amount of water specified on Data Sheet 1 has been reached.

5.3.19 WHEN flush is complete, PERFORM the following:

5.3.19.1 STOP flushing pump.

5.3.19.2 CLOSE the flush assembly valve.

5.3.20 IF plummet has been raised into the sight glass, OBSERVE condition. Plummet should appear free of tank waste.

5.3.20.1 IF directed by FWS, REPEAT Steps 5.3.15 through 5.3.20 to further clean plummet and/or tape of tank waste.

5.3.21 RECORD the following after-flush data on Data Sheet 1:

- Final flush water level reading
- Actual Flush Volume used.
5.3 Flush Level Indicator Plummets (Cont.)

5.3.22 DISCONNECT flush assembly from flush water connections on Level Indicator riser.

5.3.23 IF Densitometer/Enraf at AY-102 Waste Tank Riser-055 was flushed, ENSURE valve AY102-WST-V-140 is OPEN.

5.3.24 PERFORM radiological survey of flush hose and connection AND RECORD RSR # on Data Sheet 1.

5.3.24.1 IF additional surveys are required, RECORD in comment section of Data Sheet 1.

5.3.25 IF contamination is found, NOTIFY FWS/Shift Manager/OE.

5.3.26 IF no maintenance is required, LOWER plummet to as-found elevation.

5.3.27 RETURN Level Indicator to service as follows:
- Manual tape per TO-040-180 or an approved work package
- Enraf per 5-LCD-300, 6-LDD-485, or an approved work package.

5.3.28 OBTAIN post flush TMACS or local tank level reading AND RECORD on Data Sheet 1.

5.3.28.1 IF an annulus Enraf was flushed, ENTER N/A for tank liquid level after flush performed.
5.4 Records

NOTE - Data captured and recorded on Data Sheet 1 is required for the Waste Tank Inventory Report, which is a regulatory deliverable.

5.4.1 **SUBMIT** completed Data Sheets to SM/OE.

5.4.2 **SM/OE PERFORM** “Inventory Update” in Tank Addition eTool (TADD).

5.4.3 **PERFORM** the following for records identified within this procedure.

5.4.3.1 **RECORD** the number of times the record was generated in applicable column,

      OR

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

5.4.3.2 **SUBMIT** the package for verification of completed records.

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<tr>
<th>Records Submittal Checklist</th>
<th>Number of times completed</th>
<th>N/A (✓)</th>
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<tr>
<td>Data Sheets</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data Sheet 1</td>
<td></td>
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<tr>
<td><strong>FWS/OE/Shift Manager SEND</strong> the completed records to the Central Shift Office for records retention.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>___________________________/ ___________________________ / ___________________________</td>
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<td></td>
</tr>
<tr>
<td>Signature</td>
<td>Print (First &amp; Last)</td>
<td>Date</td>
</tr>
<tr>
<td>FWS/OE/Shift Manager</td>
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</table>

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.
# Data Sheet 1 - Routine Liquid Level Flush Data Sheet

One Data Sheet is required for EACH water usage activity

<table>
<thead>
<tr>
<th>Date:</th>
<th>Tank Number:</th>
<th>Liquid Level Device:</th>
<th>Manual Tape</th>
<th>Enraf</th>
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<tbody>
<tr>
<td>Source of Water Used for Flush: (Fill location for flush truck)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Estimated amount of water to be used for Flush (gal):</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum Amount of Water Allowed for Flush (gal):</td>
<td></td>
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**Flush Will Be Accomplished Using:**
- Hot Water [ ]
- Cold Water [ ]

<table>
<thead>
<tr>
<th>Tank liquid level before flush: (inches)</th>
<th>Calculated liquid level after flush: (inches)</th>
</tr>
</thead>
<tbody>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

**Shift Manager/OE Authorize Flush of Liquid Level Device:**

Signature / Print (First & Last) / Date

**Production Operations Engineering Manager**

Signature / Print (First & Last) / Date

---

**IF Flushing SST Liquid Level Device With Greater Than 100 Gallons of Water, OBTAIN Additional Approval from the Production Operations Engineering Manager (OSD-T-151-00013). IF Not Required, N/A Signature Block.**

Signature / Print (First & Last) / Date

---

**Flush Water Usage Readings**

**Flush Water usage determined by:**
- Water Meter [ ]
- Flush Truck Tank Increments: [ ]

**Beginning Flush Water Level Reading (gal):**

**Final Flush Water Level Reading (gal):**

**Actual Flush Water Volume Used (gal):**

**Tank liquid level after flush performed (inches):**

**RSR#:**

Signature / Print (First & Last) / Date

**HPT**

Signature / Print (First & Last) / Date

**Operator**

Signature / Print (First & Last) / Date

**Shift Manager/OE**

Signature / Print (First & Last) / Date

---

**Special Instructions:**

SM/OE UPDATE in Tank Addition eTool (TADD) AND SEND completed copies to mailbox “/Process Engineering & Environmental.”

**Comments:**

Clean Level-Indicating Transmitter Tapes, Plummets, and Displacers

Figure 2 - Enraf Series 854 ATG

ENRAF
SERIES
854 ATG

SIGHT GLASS

WASH PORT

PRESSURE PORT

BALL VALVE

RISER

256.34
Figure 3 - Flush Assembly Setup and Requirements

CONNECTS TO ITEM TO BE FLUSHED

FLEXIBLE HOSE 3-FEET LONG (MINIMUM)

FLOW METER (OPTIONAL)

SHUT OFF VALVE

TO FLUSH WATER SOURCE

FLUSH HOSE

CONNECTS TO ITEM TO BE FLUSHED

FLEXIBLE HOSE 3-FEET LONG (MINIMUM)

FLOW METER (OPTIONAL)

SHUT OFF VALVE

FLUSH HOSE

NOTE:
ANY NUMBER OF COMPONENTS MAY BE INSTALLED
DOWNSTREAM OF THE FLUSH HOSE

¼ or ½ QUICK-DISCONNECT (SOCKET)