Hydrogen Peroxide Receiving

Tank Farm Plant Operating Procedure
Effluent Treatment Facility

USQ Not Required – ETF is a < Hazard Category 3 Radiological Facility

CHANGE HISTORY (≤ LAST 5 REV-MODS)

<table>
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<tr>
<th>Rev-Mod</th>
<th>Release Date</th>
<th>Justification</th>
<th>Summary of Changes</th>
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<tr>
<td>A-2</td>
<td>04/19/2018</td>
<td>ETF Procedure update project</td>
<td>Added TFC-OPS-OPER-C-17, Operating Logbooks to Performance Documents. Updated the Records Section. Added Standard Signatures to Data Sheet 1. Corrected title of referenced document Section 4.2.</td>
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<tr>
<td>A-1</td>
<td>12/08/2016</td>
<td>Inconsequential change</td>
<td>Records section updated.</td>
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<tr>
<td>A-0</td>
<td>03/10/2016</td>
<td>Converting to WRPS Format</td>
<td>New Procedure; Supersedes ETF-PRO-OP-51529 (POP-60D-002)</td>
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</table>

Table of Contents

1.0 PURPOSE AND SCOPE ........................................................................................................... 2
  1.1 Purpose ............................................................................................................................... 2
  1.2 Scope .................................................................................................................................. 2

2.0 INFORMATION .......................................................................................................................... 2
  2.1 Terms and Definitions ........................................................................................................... 2
  2.2 General Information ............................................................................................................ 2

3.0 PRECAUTIONS AND LIMITATIONS ...................................................................................... 3
  3.1 Personnel Safety .................................................................................................................. 3
  3.2 Radiation and Contamination Control .................................................................................. 3
  3.3 Environmental Compliance ............................................................................................... 4

4.0 PREREQUISITES ...................................................................................................................... 4
  4.1 Special Tools, Equipment, and Supplies .............................................................................. 4
  4.2 Performance Documents ..................................................................................................... 4

5.0 PROCEDURE ............................................................................................................................ 5
  5.1 Prepare to Unload Bulk Hydrogen Peroxide ........................................................................ 5
  5.2 Unload Bulk Concentrated Hydrogen Peroxide ................................................................. 6
  5.3 Post-Hydrogen Peroxide Transfer Activities ..................................................................... 10
  5.4 Records ............................................................................................................................... 11

Table 1 – 50% H₂O₂ Feed Tank 60D-TL-1 .................................................................................. 12
Data Sheet 1 – Tank 60D-TK-1 Hydrogen Peroxide Receipt ....................................................... 13
1.0 PURPOSE AND SCOPE

1.1 Purpose

This procedure provides for the receipt of bulk deliveries of concentrated hydrogen peroxide (H₂O₂) to ETF.

1.2 Scope

This procedure provides instructions for unloading hydrogen peroxide from vendor-supplied tanker to H₂O₂ field tank 60D-TK-1.

2.0 INFORMATION

2.1 Terms and Definitions

- COA - Certificate of Analysis
- HDPE - High-Density Polyethylene
- IH - Industrial Hygiene.

2.2 General Information

2.2.1 Organic materials, such as paper, wood, and oil, may spontaneously catch fire on contact with hydrogen peroxide. All items/areas that may come into contact with hydrogen peroxide are to be free of foreign materials.

2.2.2 Raw or sanitary water added to concentrated hydrogen peroxide will likely accelerate decomposition. Do not add water to hydrogen peroxide unless directed to do so by the SOM.

2.2.3 Compressed air shall not be used to transfer hydrogen peroxide into the storage tank because it can accelerate the decomposition of the peroxide, cause the release of large volumes of oxygen, and increase splashing and fire hazards. Inert gases, such as nitrogen and argon, may be used.
2.2 General Information (Cont.)

2.2.4 The time required for the tank level indication to begin rising at the start of the peroxide transfer is highly variable, because it depends on several factors that can vary with each hydrogen peroxide receipt, such as:

- Whether the peroxide is transferred using a truck-supplied pump or truck-supplied compressed gas (compressed gas can take much longer because the gas space in the truck must be pressurized to approximately 10 psig before peroxide is pushed into the tank).
- The capacity of pump or compressed gas system (higher flow capacities transfer peroxide more quickly).
- Whether the tank level indication is above 0% at the start of the transfer. (Inventories that are below a 0% level will increase without a change in level indication until the level rises above 0%).
- How much empty space the truck contains, if compressed gas is used (larger empty volumes take longer to be pressurized).
- If a pump is used, a rising tank level should be seen within a few minutes. However, if truck-supplied compressed gas is used, the tank level rise will not be seen for at least a few minutes and might not be seen for over an hour.

3.0 PRECAUTIONS AND LIMITATIONS

3.1 Personnel Safety

**WARNING** - Hydrogen peroxide is extremely harmful and can cause severe eye and skin burns.

**WARNING** - When moving catch containers containing hydrogen peroxide, covers are required for slosh protection to protect workers.

3.1.1 PPE is required for personnel located inside perimeter of caution tape barrier. All personnel inside the boundary area including driver will wear company-approved PPE. Driver may present documentation for IH/IS review to verify driver PPE meets or exceeds company-supplied PPE standards.

3.2 Radiation and Contamination Control

3.2.1 Work in radiological areas will be performed using a radiological work permit following review by Radiological Control per ALARA Work Planning procedure, TFC-ESHQ-RP_RWP-C-03.
3.3 Environmental Compliance

3.3.1 In the event of a spill/leak/release, notify the SOM/FWS and respond per ETF-ERP-85B-003, Emergency Spill or Release at ETF.

4.0 PREREQUISITES

4.1 Special Tools, Equipment, and Supplies

The following supplies may be needed to perform this procedure:

- HDPE catch pans and covers for slosh protection
- Wire ties
- Spill kit
- Barriers, safety flags/tape/signs
- Vehicle chocks
- Hydrogen peroxide 50 wt% (MSDS/SDS #066526)
- Safety glasses with side shields
- Hard hat with affixed face shield, or Tychem hood with face shield
- Chemical goggles
- Chemical-resistant suit (e.g., green Tychem)
- Chemical-resistant gloves (e.g., 15-mil nitrile)
- Chemical-resistant boots or overshoes
- Chemical-resistant tape.

4.2 Performance Documents

The following documents may be needed to perform this procedure:

- ETF-ERP-85B-003, Emergency Spill or Release at ETF
- TFC-OPS-OPER-C-17, Operating Logbooks.
5.0 PROCEDURE

NOTE - Steps in Section 5.1 may be performed in any logical order prior to the performance of Section 5.2.

5.1 Prepare to Unload Bulk Hydrogen Peroxide

5.1.1 SET UP trend at LI-60D313 tank 60D-TK-1 level to monitor hydrogen peroxide level in tank.

5.1.2 FROM group display 638, RECORD LI-60D313 tank 60D-TK-1 percent level on Data Sheet 1.

5.1.3 CALCULATE the following per Data Sheet 1:
   - Current volume
   - Available volume.

5.1.4 ENSURE truck off-loading area is free of the following:
   - Obstructions
   - Combustible materials.

5.1.5 ASSIST truck driver in spotting truck into position.

5.1.6 ENSURE vehicle/wheel chocks are properly positioned.

NOTE - Boundary should extend a minimum of 80 feet from tanker pump and connection area.

5.1.7 ESTABLISH caution barrier/sign around perimeter of off-loading area.

5.1.8 REQUEST SOM/FWS and truck driver discuss estimated time required for LI-60D313, tank 60D-TK-1 level, to start rising.
5.1 Prepare to Unload Bulk Hydrogen Peroxide (Cont.)

WARNING
Hydrogen peroxide is extremely harmful and can cause severe eye and skin burns.

NOTE - PPE is required for personnel located inside perimeter of caution barrier. All personnel inside the boundary area including driver will wear company-approved PPE. Driver may present documentation for IH/IS review to verify driver PPE meets or exceeds company-supplied PPE standards.

5.1.9 DON the following required PPE:
- Hard hat with affixed face shield, or Tychem hood with face shield
- Chemical goggles
- Chemical-resistant suit (green Tychem or equivalent)
- Chemical-resistant gloves (15-mil nitrile or equivalent)
- Chemical-resistant boots or overshoes.

5.1.10 ENSURE seams have been taped for chemical resistant suit/glove with chemical resistant tape.

5.2 Unload Bulk Concentrated Hydrogen Peroxide

5.2.1 ESTABLISH communications with CRO.

5.2.2 PLACE HDPE drip catch pans under the following:
- Trailer hose connection
- 60D-TK-1 fill connection.

5.2.3 UNLOCK AND REMOVE line cap from 60D-TK-1 fill connector.

5.2.4 CONNECT trailer transfer hose to 60D-TK-1, hydrogen peroxide storage tank fill connector, and the tanker trailer.

5.2.4.1 DO NOT OPEN tanker trailer transfer valve.

5.2.5 SECURE all transfer hose cam-lock fittings including 60D-TK-1 tank fill connection and tanker trailer with wire ties.
5.2 Unload Bulk Concentrated Hydrogen Peroxide (Cont.)

5.2.6 (Driver) **PREPARE** trailer for off-loading bulk hydrogen peroxide (e.g., open vents, prepare pumps and/or compressors or nitrogen purge systems – Do not open tanker transfer valve).

5.2.7 (Operator and Driver) **PERFORM** final checks.

5.2.8 **NOTIFY** CRO truck is ready to be unloaded.

5.2.9 **OBTAIN** permission from SOM to commence truck unloading.

5.2.10 **OPEN** hydrogen peroxide fill isolation valve 60D-042.

**Special Instructions**

Personnel should stand by at a location away from pump and connections during transfer.

5.2.11 **REQUEST** truck driver perform the following:

- Open tanker transfer valve
- Start transfer of hydrogen peroxide to tank 60D-TK-1.

5.2.12 **IF** leaks are detected at any time during transfer, **PERFORM** the following:

5.2.12.1 **CONFERENCE** with SOM/FWS and truck driver to determine if leak or drip may be contained within absorbent pad or catch container.

5.2.12.2 **CONTINUE** transfer at direction of SOM/FWS.

5.2.12.3 **RECORD** SOM/FWS direction in ETF Control Room Logbook.

5.2.13 **IF** spill or release occurs at any time during transfer, **PERFORM** the following:

5.2.13.1 **IF** possible for truck driver to perform safely, **DIRECT** truck driver to stop transfer.

5.2.13.2 **NOTIFY** CRO and SOM.

5.2.13.3 **GO TO** ETF-ERP-85B-003.

a. **AFTER** response has been completed per ETF-ERP-85B-003 and with SOM concurrence, **RETURN** to this procedure **AND**

**PROCEED TO** step 5.2.13.4.
5.2 Unload Bulk Concentrated Hydrogen Peroxide (Cont.)

5.2.13.4 IF directed by SOM, PERFORM the following:

a. REQUEST truck driver clear the transfer hose, as follows:
   1. IF using compressed nitrogen or argon, BLOW DOWN transfer hose.
   2. IF draining the hose, COLLECT drained peroxide in a plastic bucket.

b. WHEN transfer line has been cleared, CLOSE 60D-042.

c. RE-SECURE transfer fill hose cam-lock connection.

5.2.13.5 IF directed by SOM, RETURN to this procedure at step 5.2.8.

5.2.14 (CRO) ON LI-60D313, MONITOR tank 60D-TK-1 level.

5.2.15 (CRO) WHEN LI-60D313 starts to indicate a rising tank level, NOTIFY outside operator.

5.2.16 IF LI-60D313 does not indicate an increasing level within the time determined by the SOM, PERFORM the following:

   5.2.16.1 DIRECT truck driver to stop transfer.
   5.2.16.2 NOTIFY Control Room transfer has stopped.
   5.2.16.3 CONTACT SOM for instructions.

NOTE - Maximum operating capacity of 60D-TK-1 is 2379 gallons.

5.2.17 IF hydrogen peroxide storage tank high level alarm, LAH-60D313 annunciates during transfer, PERFORM the following:

   5.2.17.1 (CRO) NOTIFY outside operator of alarm.
   5.2.17.2 DIRECT truck driver to stop transfer.
   5.2.17.3 LOOK through the translucent walls of 60D-TK-1 AND OBSERVE level reading on LI-60D-313.
   5.2.17.4 CONTACT SOM for instructions.
5.2 Unload Bulk Concentrated Hydrogen Peroxide (Cont.)

5.2.17.5 IF directed by SOM, PERFORM the following:

a. NOTIFY CRO that truck unloading is ready to start again AND

GO TO step 5.2.11 to restart unloading.

OR

GO TO step 5.2.19 to end chemical receipt.

b. RECORD SOM directions in ETF Control Room Logbook.

5.2.18 WHEN required volume is transferred, DIRECT truck driver to stop transfer.

5.2.19 WHEN transfer has stopped, CLEAR transfer hose, as follows:

5.2.19.1 IF using compressed nitrogen or argon, CLOSE tanker transfer valve AND

BLOW DOWN transfer hose.

a. WHEN blow down is complete, CLOSE hydrogen peroxide fill isolation valve 60D-042.

5.2.19.2 IF draining the hose, CLOSE hydrogen peroxide fill isolation valve, 60D-042 and tanker transfer valve AND

COLLECT drained peroxide in a plastic bucket.
5.3 Post-Hydrogen Peroxide Transfer Activities

5.3.1 PERFORM the following to secure transfer activities:

5.3.1.1 DISCONNECT transfer hose from 60D-TK-1 fill connector and tanker trailer.

5.3.1.2 INSTALL AND LOCK cap on 60D-TK-1 fill connector.

WARNING
When moving catch containers containing hydrogen peroxide, covers are required for slosh protection to protect workers.

5.3.1.3 PLACE covers on catch containers.

5.3.1.4 CLEAN area of any leakage per SOM direction.

5.3.1.5 RINSE AND DISPOSE of any waste in appropriate waste container.

5.3.1.6 REMOVE vehicle chocks.

5.3.2 NOTIFY CRO transfer is complete.

5.3.3 COMPLETE Data Sheet 1.

5.3.4 ATTACH COA to Data Sheet 1 AND

FORWARD the following to the SOM:
- Data Sheet 1
- COA
- Current copy of MSDS/SDS.

5.3.5 (SOM) PROVIDE the following to the Design Authority:
- Copy of Data Sheet 1
- COA
- Current copy of MSDS/SDS.
5.4 Records

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

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

OR

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

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<td>Data Sheet 1 – Tank 60D-TK-1 Hydrogen Peroxide Receipt (which includes COA attachment)</td>
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<td><strong>MSDS/SDS</strong></td>
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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.
Table 1 – 50% H₂O₂ Feed Tank 60D-TL-1

Tank Contents (gallons) = (LL% * 24.13)

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<th>Volume (gallons)</th>
<th>Liquid Level (%)</th>
<th>Volume (gallons)</th>
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Note:
No overflow.
Level instrument calibration has been corrected for 1.2 SpG for 50% H₂O₂.
For SpGs other than 1.2, multiply volume number by 1.2 / (current SpG).
* Information for tank holdup below 0% is not available (87 gallons is assumed).

(Ref. VI #22360, Supp. 1, Doc. V-135A-002-330)
# Hydrogen Peroxide Receiving

## Data Sheet 1 – Tank 60D-TK-1 Hydrogen Peroxide Receipt

**Required Data**

<table>
<thead>
<tr>
<th>Description</th>
<th>Gallons</th>
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<tr>
<td>Current tank level (*)</td>
<td>=</td>
</tr>
<tr>
<td>Current tank volume (**)</td>
<td>=</td>
</tr>
<tr>
<td>Max. tank volume, gal</td>
<td>=</td>
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</tbody>
</table>

*Obtain Graphic Group Display #638, (LI-60D313), Tank 60D-TK-1 percent level  
**Obtain from Appendix B, “50% H2O2 Feed Tank 60D-TK-1,” Volume versus Level Percent

Formula: Maximum Volume – Current Volume = Available Volume for Off-Loading  
\[
\text{Maximum Volume} - \text{Current Volume} = \text{Available Volume (for Off-load)}
\]

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<thead>
<tr>
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<th>Truck #</th>
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<table>
<thead>
<tr>
<th>Description</th>
<th>Gallons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start Time:</td>
<td>Stop Time:</td>
</tr>
</tbody>
</table>

| Final volume of hydrogen peroxide in Tank 60D-TK-1 |
| Initial volume of hydrogen peroxide in Tank 60D-TK-1 |

| Total volume delivered to ETF (Final Vol − Initial Vol) |

<table>
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<tr>
<th>Signature</th>
<th>Print (First &amp; Last)</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operator</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Signature</th>
<th>Print (First &amp; Last)</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOM</td>
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**Example Calculation**

LI-65D313 = 15%  

Formula 1: Current Volume = 449 gallons  
Formula 2: Available Volume = 2379 gallons − 449 gallons = 1930 gallons