Receive Bulk Sulfuric Acid

Tank Farm Plant Operating Procedure  Effluent Treatment Facility

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

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INTRODUCTION

1.1 Purpose

This procedure provides instructions for unloading bulk deliveries of concentrated sulfuric acid (H₂SO₄) to tank 65C-TK-1 at ETF.

1.2 Scope

This procedure includes off-loading bulk concentrated sulfuric acid at ETF. Tanker trucks covered by this procedure are vendor-supplied bulk chemical tankers.

INFORMATION

2.1 Terms and Definitions

- COA - Certificate of Analysis.

2.2 General Information

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

- Whether the sulfuric acid is transferred using a truck-supplied pump or truck-supplied compressed air (compressed air can take much longer because the air space in the truck must be pressurized to approximately 15 psig before sulfuric acid is pushed into the tank).
- The sulfuric acid level in the tank even if above 0%, if compressed air is used (higher initial levels require higher air pressures to overcome back pressure caused by liquid in the tank).
- The capacity of pump or air compressor (higher flow capacities transfer sulfuric acid 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 air is used (larger air volumes take longer to be pressurized).
- If a pump is used, a rising tank level should be seen within a few minutes. However, if a truck-supplied air compressor 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** - Concentrated sulfuric acid is extremely harmful and can cause severe burns to the skin and eyes.

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

3.1.1 Water added to concentrated acid will likely cause splattering. (Do not add water to acid unless directed to do so by SOM.)

3.1.2 If sulfuric acid contacts skin or eyes, immediately rinse affected area with water for at least fifteen minutes and contact SOM/Control Room. (Do not rub the affected area.)

3.1.3 Acid aerosols can be irritating to the eyes and respiratory tract.

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.

3.4 Waste Management

3.4.1 Waste generated from use of this procedure shall be managed as Mixed Low level per TFC-OPS-WM-C-31, Regulated Waste Generation and Storage
4.0 PREREQUISITES

4.1 Special Tools, Equipment, and Supplies

The following supplies may be needed to perform this procedure:

- HDPE catch pans and cover(s) for slosh protection
- Wire ties
- Truck hose connection padlock keys (from SOM)
- Spill kit
- Barriers, safety flags/tape/signs
- Vehicle wheel chocks
- Sulfuric acid (MSDS/SDS #072966)
- Safety glasses with side shields
- 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
- 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 Acid**

5.1.1  **CONFIRM** the following safety shower and eyewash station are operational (i.e., flow water):
- Unload area
- Room 131 Chem. Berm Area
- LAB.

5.1.2  **OPEN** south roll-up door to provide clear access to the Chem. Berm Area safety shower.

5.1.3  **IF** liquid is present in acid berm sump, **NOTIFY** SOM AND **PUMP** sump per SOM direction.

5.1.4  **MOVE** tank local high level alarm switch, LAH-65C105, to NORMAL position.

5.1.5  **SET UP** trend of LI-65C101, tank 65C-TK-1 level, to monitor acid level in tank.

5.1.6  **FROM** group display 48, **RECORD** LI-65C101, Tank 65C-TK-1 Level (in percent) on Data Sheet 1 – Tank 65C-TK-1, Acid Receipt.

5.1.7  **CALCULATE** current and available volume per Data Sheet 1.

5.1.8  **OBTAIN** key for padlock on transfer hose connection to 65C-TK-1. (Lock will be removed in Section 5.2.)

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

5.1.10  **ASSIST** truck driver by spotting truck into position.

5.1.11  **ENSURE** vehicle/wheel chocks are properly positioned.
5.1 Prepare to Unload Acid (Cont.)

NOTE - Boundary should extend a minimum of 50 feet from tanker pump and connection area.

5.1.12 ESTABLISH caution barrier/signs around perimeter of off-loading area.

5.1.13 CONFIRM location and operation of truck emergency cut-off with truck driver.

5.1.14 REQUEST SOM and truck driver discuss the estimated time required for LI-65C101, tank 65C-TK-1 level, to start rising AND NOTIFY all personnel of expected results.

WARNING
Concentrated sulfuric acid is extremely harmful and can cause severe burns to the skin and eyes.

NOTE - PPE is required for personnel located inside perimeter of caution barrier/sign. 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.

5.1.15 DON required PPE:
- Hard hat with affixed face shield, or Tychem hood with face shield
- Chemical goggles
- Full chemical-resistant suit (green Tychem suit) or equivalent
- Chemical-resistant boots or over shoes
- Chemical resistant glove (15-mil butyl rubber or equivalent).

5.1.16 SECURE openings/joints with chemical tape unless clothing is manufactured with equivalent protection (double-flap closure, e.g., zipper and velcro flap).
5.2 Unload Concentrated Sulfuric Acid

5.2.1 **ESTABLISH** communications with CRO.

5.2.2 **PLACE** spill pads and HDPE catch pans under the following:
- Trailer hose connection
- In basin under 65C-TK-1 fill connector.

5.2.3 **UNLOCK AND REMOVE** line cap from 65C-TK-1 fill connector.

5.2.4 **CONNECT** trailer unloading hose to 65C-TK-1, sulfuric acid 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 65C-TK-1 fill connector and tanker trailer with wire ties.

5.2.6 (Driver) **PREPARE** trailer for off-loading bulk sulfuric acid (e.g., open vents, prepare pumps and/or compressors or nitrogen purge systems).

5.2.6.1 **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 **ENSURE** SOM signs Data Sheet 1 for authorization to start truck unloading.

5.2.10 **OPEN** acid fill line block valve 65C-085.

**Special Instructions**

Personnel should standby 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 acid to tank 65C-TK-1.

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

5.2.12.1 **CONFÉR** 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 Unload Concentrated Sulfuric Acid (Cont.)

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.

5.2.13.4 IF directed by SOM, PERFORM the following:

a. REQUEST truck driver clear blow down transfer hose (using compressed air from truck or portable air compressor).

b. WHEN transfer line has been cleared, CLOSE 65C-085.

c. ADJUST any loose transfer hose cam-lock connection and wire ties.

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

5.2.14 (CRO) ON LI-65C101, MONITOR tank 65C-TK-1 level.

5.2.15 (CRO) WHEN LI-65C101 starts to indicate a rising level, NOTIFY outside operator.

5.2.16 IF LI-65C101 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 CRO transfer has stopped.

5.2.16.3 CONTACT SOM for instructions.
5.2 **Unload Concentrated Sulfuric Acid (Cont.)**

NOTE - False high-level alarms can be triggered by LS-65C105, due to vapor condensing or acid splashing on the switch’s probe. An actual high level condition can be confirmed by evaluating the trend of LI-65C101 for steady increase to the high level set point of LAHX-65C101 in ARP-65C001.

5.2.17 **IF** sulfuric acid storage tank high level alarm, LAHX-65C101, annunciates during transfer, 

**OR**

**IF** transfer needs to be stopped for any other condition, **PERFORM** the following:

5.2.17.1 **(CRO) NOTIFY** outside operator of alarm or condition.

5.2.17.2 **DIRECT** truck driver to stop transfer.

5.2.17.3 **CONTACT** SOM for instructions.

5.2.17.4 **IF** directed by SOM, **PERFORM** the following:

a. **NOTIFY** CRO truck unloading is ready to start again.

b. **GO TO** step 5.2.11 to restart unloading.

5.2.17.5 **IF** directed by SOM, **GO TO** step 5.2.19 to end chemical receipt.

5.2.18 **WHEN** required volume of acid has been transferred, **DIRECT** truck driver to stop transfer.

5.2.19 **WHEN** transfer has stopped, **ENSURE** transfer line blow down is complete (use compressed air from truck or portable air compressor).

5.2.20 **WHEN** transfer line has been cleared, **REQUEST** driver close transfer line valves **AND**

**CLOSE** valve 65C-085.
5.3  Post-Bulk Sulfuric Acid Transfer Activities

5.3.1  PERFORM the following to secure transfer activities:

NOTE - Steps 5.3.1.1 through 5.3.1.7 may be performed in any logical order.

5.3.1.1  DISCONNECT transfer hose from 65C-TK-1 fill connector.

5.3.1.2  INSTALL AND LOCK cap on 65C-TK-1 fill connector.

WARNING
When moving catch containers containing acid, 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  MOVE tank local high level alarm switch, LAH-65C105, to OFF/ACK position.

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

5.3.1.7  REMOVE vehicle wheel chocks.

5.3.2  NOTIFY CRO transfer is complete.

5.3.3  COMPLETE Data Sheet 1.

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

5.3.5  (SOM) PROVIDE the following to the Facility Chemical Manager:
- 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 **PLACE** a check mark (✓) in the N/A column.

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

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<tr>
<td>Data Sheet 1 – Tank 65C-TK-1, Acid Receipt</td>
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<tr>
<td>FWS/OE/Shift Manager <strong>SEND</strong> the completed records to the Central Shift Office for records retention</td>
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The record custodian identified in the Company Level Record Inventory and Disposition Schedule (RIDS) is responsible for record retention in accordance with TFC-BSM-IRM_DC-C-02.
## Table 1 – 92% $\text{H}_2\text{SO}_4$ Storage Tank 65C-TK-1

Tank Contents (gallons) = (LL% * 75) +560
Ref. HNF-FMP-02-9899-R0, except 0-100% level is calibrated to 560-8060 gallons

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<th>Volume (Gallons)</th>
<th>Liquid Level (%)</th>
<th>Volume (Gallons)</th>
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**NOTE:**
100% level below tank overflow. Overflow at 8985 gallons.
**Receive Bulk Sulfuric Acid**

### Data Sheet 1 – Tank 65C-TK-1, Acid Receipt

#### Required Data

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<thead>
<tr>
<th>Current tank level (*)</th>
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<tr>
<td>Current tank volume (**)</td>
<td>=</td>
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<tr>
<td>Max. tank volume, gal</td>
<td>= 7085 gal</td>
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*Obtain Graphic Group Display #49, (LI-65C101), Tank 65C-TK-1 percent level

**Obtain from Table 1: 92% H$_2$SO$_4$ Tank, 65C-TK-1, Volume versus Level Percent

Formula: Maximum Volume – Current Volume = Available Volume for Off-Loading

| 7085 gal | – |  = |

Step 5.2.9: SOM authorize unloading:

| Signature | / | Print (First Last) | / | Date |

Vendor: | Truck # |

<table>
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<th>Description</th>
<th>Gallons</th>
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<tr>
<td>Start Time:</td>
<td>Stop Time:</td>
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<tr>
<td>Final acid volume in 65C-TK-1</td>
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</tr>
<tr>
<td>Initial (current) acid volume in 65C-TK-1</td>
<td></td>
</tr>
<tr>
<td>Total acid volume delivered to ETF (Final Vol - Initial Vol)</td>
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</tr>
</tbody>
</table>

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

Operator |

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

SOM

**Example Calculation**

LI-65C101 = 15%

Table 1: Current Volume = 1685 gal

Formula: Available Volume = 7,085 gal – 1685 gal = 5400 gal