Receive Bulk Sodium Hydroxide

Tank Farm Plant Operating Procedure  Effluent Treatment Facility

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

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1.0 PURPOSE AND SCOPE

1.1 Purpose

This procedure provides instructions for unloading bulk deliveries of concentrated caustic sodium hydroxide [NaOH] to tank 65C-TK-2 at ETF.

1.2 Scope

This procedure involves off-loading bulk sodium hydroxide at ETF. Tanker trucks covered by this procedure are vendor-supplied bulk chemical tankers.

2.0 INFORMATION

2.1 Terms and Definitions

- COA - Certificate of Analysis.

2.2 General Information

2.2.1 No other work shall be in progress in the immediate vicinity of the off-loading activity.

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

- Whether caustic 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 caustic is pushed into the tank).
- The capacity of pump or air compressor (higher flow capacities transfer caustic more quickly).
- Whether 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).
- Caustic 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).
3.0 PRECAUTIONS AND LIMITATIONS

3.1 Personnel Safety

**WARNING** - Caustic is extremely harmful and can cause severe burns to the skin and eyes.

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

3.1.1 Do not add water to caustic. Water added to concentrated caustic will likely cause splattering.

3.1.2 Upon completion of any portion of this procedure which requires PPE, personnel must inspect their PPE for caustic residue or other contaminates. If caustic residue or other contaminates are found or suspected, dispose of the PPE compliant with ETF waste management processes in accordance with ETF-65D-003, Package Waste.

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.
Receive Bulk Sodium Hydroxide

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
- Truck hose connection padlock keys (from SOM)
- Spill kit
- Barriers, safety flags/tape/signs
- Vehicle wheel chocks
- Sodium hydroxide (MSDS/SDS #074597)
- 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-ARP-65C-001, Chemical Feed System.
- ETF-ERP-85B-003, Emergency Spill or Release at ETF.
- ETF-65D-003, Package Waste.
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 Caustic

5.1.1 CONFIRM the following safety shower and eyewash stations 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 the caustic berm sump, NOTIFY SOM AND PUMP sump per SOM direction.

5.1.4 MOVE tank local high level alarm switch, LAH-65C204, to NORMAL position.

5.1.5 SET UP trend of LI-65C-201, tank 65C-TK-2 level, to monitor caustic level in tank.

5.1.6 FROM group display 49, RECORD LI-65C-201, Tank 65C-TK-2 level (in percent) on Data Sheet 1.

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-2. (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 Caustic (Cont.)

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

5.1.12 ESTABLISH caution barrier 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-65C-201, tank 65C-TK-2 level, to start rising AND NOTIFY all personnel of expected results.

WARNING
Caustic 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. 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
- Chemical-resistant suit (green Tychem or equivalent)
- Chemical-resistant gloves (15 mil nitrile or equivalent)
- Chemical-resistant boots or overshoes.

5.1.16 IF clothing is NOT manufactured with equivalent protection (double-flap closure, e.g., zipper and velcro flap), SECURE openings/joints with chemical tape
5.2 Unload Concentrated Caustic

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-2 fill connector.

5.2.3 UNLOCK AND REMOVE line cap from 65C-TK-2 fill connector.

5.2.4 CONNECT trailer transfer hose to caustic storage tank 65C-TK-2, caustic 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-2 fill connector and tanker trailer with wire ties.

5.2.6 (Driver) PREPARE trailer for off-loading bulk caustic (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 on Data Sheet 1 for authorization to start truck unloading.

5.2.10 OPEN caustic fill block valve 65C-067.

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 caustic to tank 65C-TK-2.
5.2 Unload Concentrated Caustic (Cont.)

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

5.2.12.1 **CONFER** 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.

5.2.13 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 blow down transfer line (using compressed air from truck or portable air compressor).

   b. **WHEN** transfer line has been cleared, **CLOSE** 65C-067.

   c. **ADJUST** any loose transfer hose cam-lock connection with 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-65C-201, **MONITOR** tank 65C-TK-2 level.

5.2.15 (CRO) **WHEN** LI-65C-201 starts to indicate a rising tank level, **NOTIFY** outside operator.
5.2 Unload Concentrated Caustic (Cont.)

5.2.16 IF LI-65C-201 indicates an increasing level within the time expected by 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.

**NOTE** - Maximum operating capacity of 65C-TK-2 is 4828 gallons.
- False high-level alarms can be triggered by LS-65C-204 because of vapor condensing or caustic splashing on the switch’s probe. A high level condition can be confirmed by evaluating the trend of LI-65C-201 for a steady increase to the high level setpoint of LAHX-65C-201 in ETF-ARP-65C-001.

5.2.17 IF caustic storage tank high level alarm LAH-65C204 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 **CONTACT** SOM for instructions.

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

a. **NOTIFY** CRO that 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 caustic 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-067.
5.3 Post-Bulk Caustic Transfer Activities

5.3.1 PERFORM the following to secure transfer activities:

5.3.1.1 DISCONNECT transfer hose from 65C-TK-2 fill connector.

5.3.1.2 INSTALL AND LOCK cap on 65C-TK-2 fill connector.

WARNING

When moving catch containers containing caustic, 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-65C204, 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 to 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

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

5.4.1.2 SUBMIT the package for verification of completed records.

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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 – 50% NaOH Storage Tank, 65C-TK-2

Tank contents (gallons) = (LL% \times 50) + 578

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<th>Liquid Level (%)</th>
<th>Volume (Gallons)</th>
<th>Liquid Level (%)</th>
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Notes: No overflow. (Ref. Adtechs #C-1223-003, Rev. 5, except 0 to 100% is calibration 0 to 5,000 gallons.)
Data Sheet 1 – Tank 65C-TK-2, Caustic Receipt

**Required Data:**
- Current tank level (*) = __________%
- Current tank volume (**) = __________gal
- Max. tank volume (gal) = 4828 gal

* Obtain Graphic Group Display #49 (LI-65C-201), Tank 65C-TK-2 percent level
** Obtain from Table 1 – “50% NaOH Tank, 65C-TK-2, Volume versus Level Percent”

**Formula 2: Maximum Volume − Current Volume = Available Volume for Off-Loading**

\[
\text{Available Volume (for off-load)} = \frac{\text{Max. volume} - \text{Current Volume}}{\text{Current Volume}}
\]

Step 5.2.9: SOM authorize unloading:

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<th>Signature</th>
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Vendor: _______________ Truck # __________

**Description**

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<td>Stop Time:</td>
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<tr>
<td>Final volume of caustic in 65C-TK-2</td>
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<td>Initial volume of caustic in 65C-TK-2</td>
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<td>Total volume of caustic delivered to ETF (Final Volume − Initial Volume)</td>
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**Example Calculation**

LI-65C-201 = 10%

Formula 1: Current Volume = 1078 gallons

Formula 2: Available Volume = 4828 gallons − 1078 gallons = 3750 gallons