Petrochem/Refinery Sample Material

The following samples illustrate typical documents for a refinery or petrochemical plant. Text that is in blue is hyperlinked to respective areas within the document, for illustrative purposes.

These samples may not be complete and are used to illustrate how a typical document might appear.

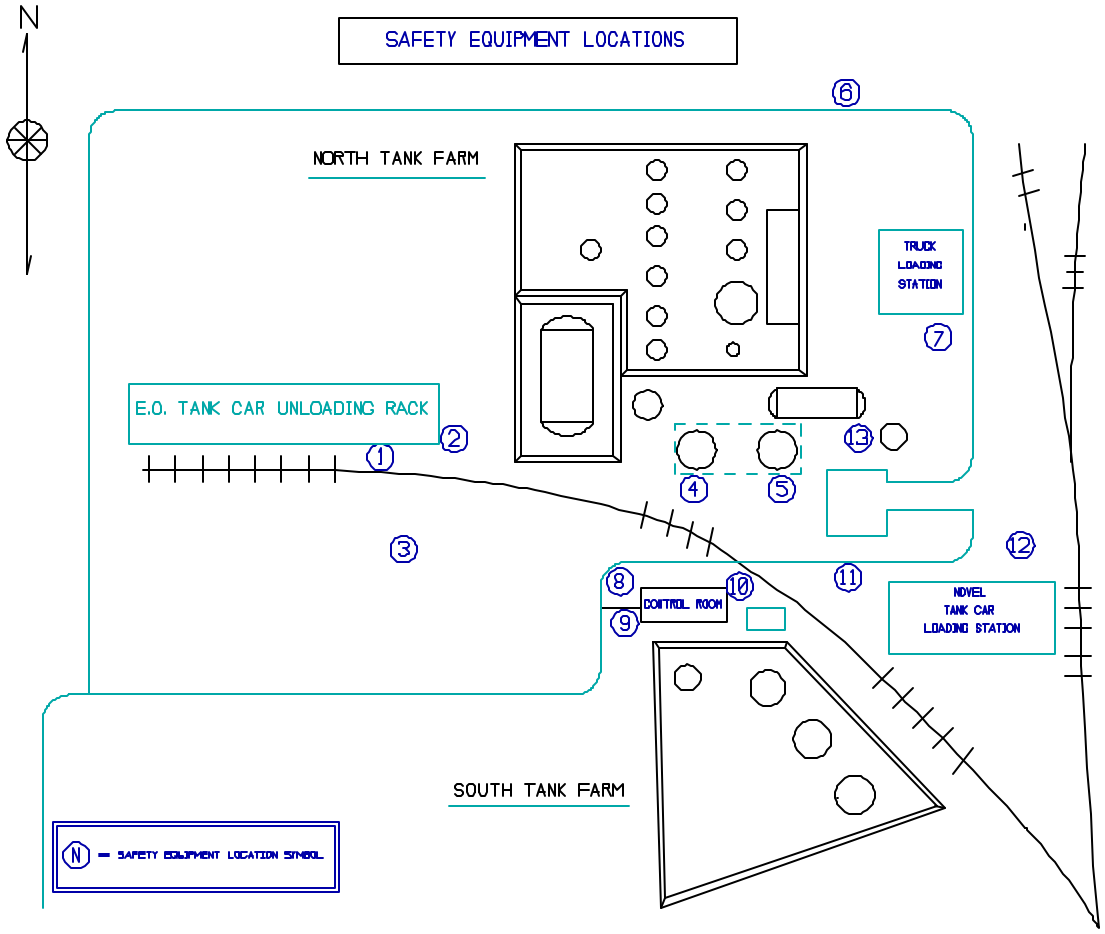
ETO UNIT TRAINING MANUAL

TABLE OF CONTENTS

TABLE OF CONTENTS (Cont.)

TABLE OF CONTENTS (Cont.)

3.1 **SAFETY EQUIPMENT LOCATIONS** should be clearly marked and readily available to handle emergency situations such as fire, explosion, and chemical contact. The following chart and table describe field and control room pieces of safety equipment to be used in case of emergency situations.



1, 2	TANK CAR LOADING RACK	-- *Fire Extinguisher, Safety Shower*
3	NW of CONTROL ROOM	-- *Wind Sock #1*
11	SE of CONTROL ROOM	-- *Wind Sock #2*
4	DC-2 REACTOR	-- *Safety Shower, Eyewasher, Fire Monitor*
5	REACTOR (DC-1)	-- *Eyewasher, Fire Ext.*
6	NE Battery Limits	-- *Fire Monitor*
7	TRUCK LOADING STATION	-- *Fire Ext., Eyewasher, Safety Shower*
8	CONTROL ROOM	
9	• Inside	-- *Scott Air Pack*
10	• NE & SW	-- *Scott Air Packs (2) & Respirators*
11	• North	-- *Chemical Suits*
12	• NE @ tracks	-- *Fire Monitor*

3.2 **ENVIRONMENTAL SAFETY** activities are mandated by Federal, State, and/or Local Governments for all hazardous chemical processing plants. Protection of air, water, land, and surrounding life from pollution must comply with controls established by governmental regulatory agencies.

Government Agencies involved in setting reportable quantities on various chemical spills, leaks, or releases include the following:

- RCRA - Resource Conservation and Recovery Act of 1976
- CERCLA - Comprehensive Environmental Response, Comprehensive and Liability Act
- SARA - Superfund Amendments and Re-authorization Act of 1986
- LA Air - Louisiana Air

REPORTABLE QUANTITIES
(in pounds)

CHEMICAL	CERCLA	SARA/ST. POLICE	LA AIR	CLASS
Acetic Acid		5000		Corrosive
Ethylene Oxide *	10	10	1	Flammable Gas
Novel II Neutralizer	100			
Sodium Hydroxide	100			Corrosive
Nitrogen			5000	Non Flammable
Any Other Liquids		500		

* In the case of Ethylene Oxide and Novel II catalyst spills of one (1) gallon, fill out an LCCP Spill Report and notify the Shift Supervisor immediately.

AREA 1 (ETO)	Shift Supervisor **ext. 5357** or call Alcohol Shift Supervisor's Radio Channel
AREA 2	Shift Supervisor **ext. 5658** or call Ethylene Shift Supervisor's Radio channel

3.0 FEED PREPARATION SYSTEM - Equipment Descriptions, continued

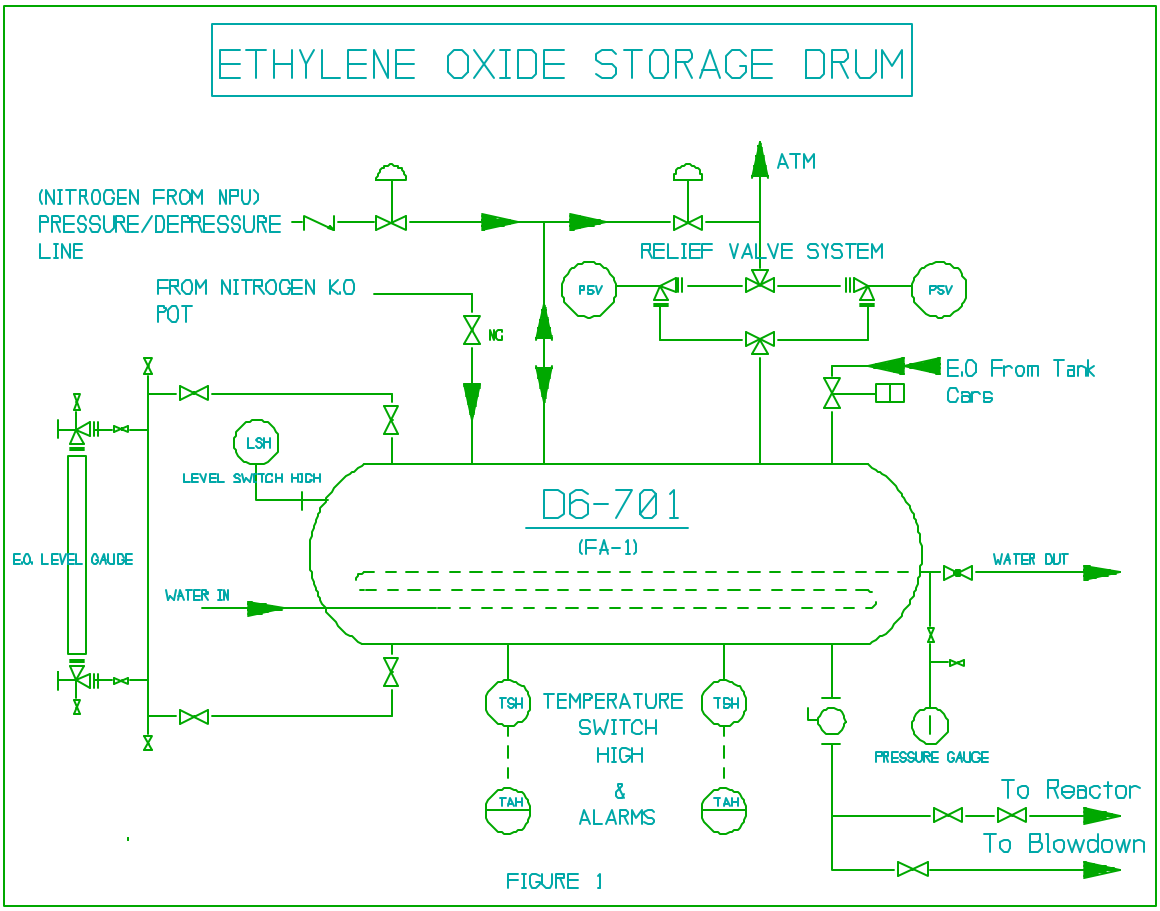


FIGURE 1

Physical Description - Horizontal vessel on concrete supports. Vessel is insulated and exterior is covered with reflective lagging.

Dimensions - Length - 22 feet; Diameter - 12 feet

Capacity - 25,000 gallons

Operating Pressure - Range: 40-75 psig; Setpoint: 45 psig

Operating Temperature - Less than 85 °F

Material Transfer Method - Nitrogen Pressure

3.0 FEED PREPARATION SYSTEM - Equipment Descriptions, continued

3.2.1 Ethylene Oxide Storage Drum, continued

Instrumentation -

Local mounted drum temperature gauge
Local mounted drum pressure gauge
Level glass sight (east side of drum)
Nitrogen Pressure Controller PIC-119 controls
Pressure Alarm High-Low
High Level Alarm
Low Differential Pressure Alarm

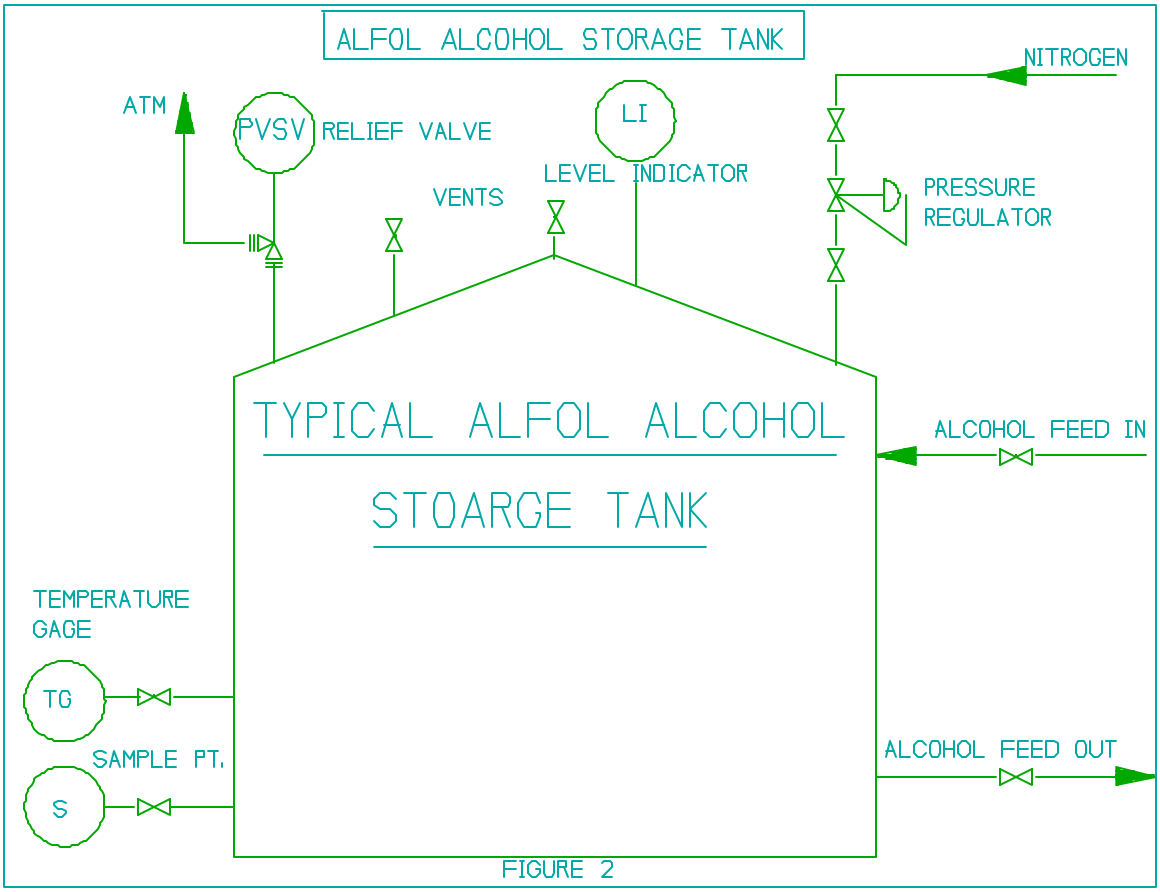
3.2.2 **ALCOHOL STORAGE EQUIPMENT** - Alfol® Alcohol is produced at XYZ and stored in the following North Tank Farm storage tanks:

- FB-1 (T6-701)
- FB-2 (T6-702)
- FB-5 (T6-705)
- FB-7 (T6-707)
- FB-8 (T6-708)

Pump (P6-704) is the primary charge pump for moving alcohol from storage to the Reactor for Ethoxylate production.

Typical Alcohol storage tanks are equipped with pressure safety relief valves, temperature gauges, level indicators, and pressure controlled Nitrogen blanket. (See figure 2, next page)

3.0 FEED PREPARATION SYSTEM - Equipment Descriptions, continued



Typical Capacities (gallons):

FB-1&2 - 10372 each

FB-5 - 26403

FB-7 - 7430

FB-8 - 7428

3.0 FEED PREPARATION SYSTEM - Equipment Descriptions, continued

3.2.3 Novel® II CATALYST STORAGE EQUIPMENT - Novel® II Catalyst is used to manufacture Novel® II Ethoxylates. The catalyst is stored in the Novel II Catalyst storage tank (T6-714).

A drawing of the Novel II storage tank follows showing associated process control instrumentation:

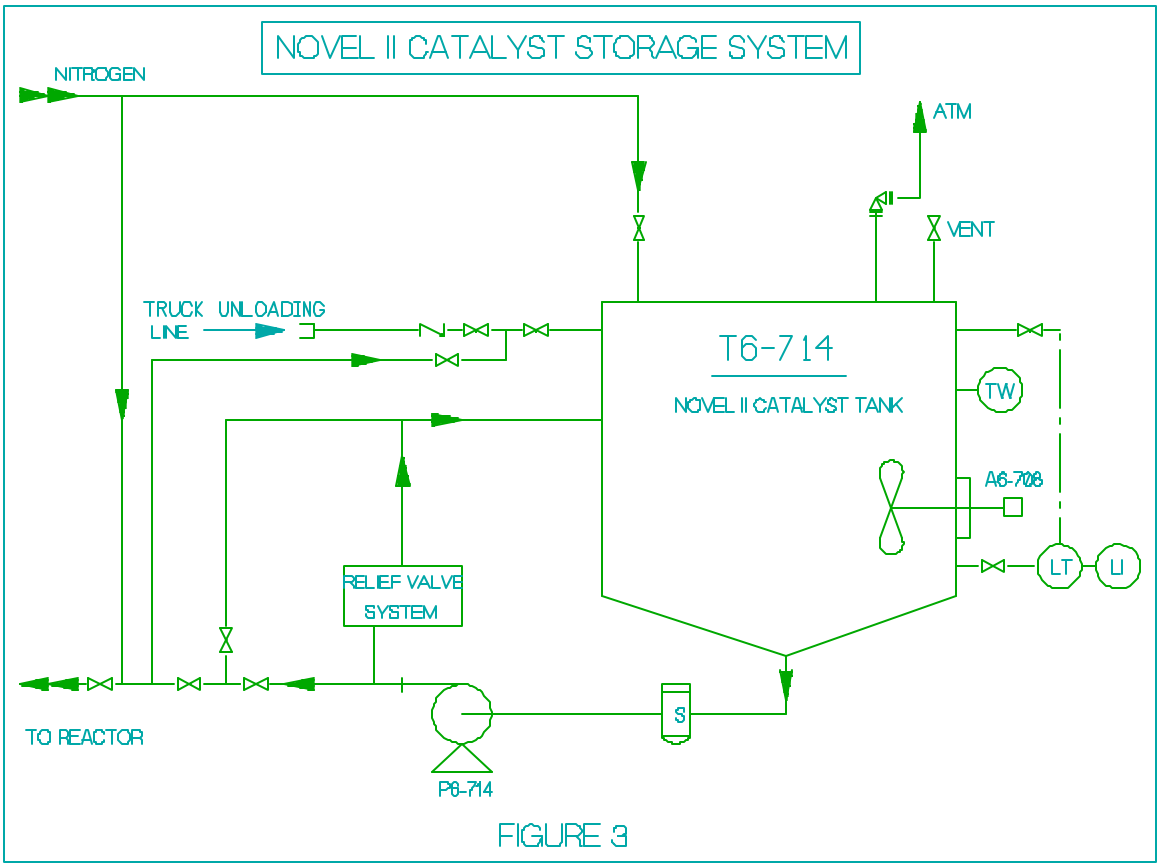


FIGURE 3

Physical Description - Cone Roof Chemical Storage Tank

Capacity - 8511 gallons

Operating Pressure - 0.5 inches water column

Operating Temperature - 140 °F

Transfer Method - Pump P6-714

3.0 FEED PREPARATION SYSTEM - Equipment Descriptions, continued

3.2.4 CAUSTIC STORAGE TANK - Caustic or, 50% solution sodium hydroxide is used as a catalyst for ALFONIC® Ethoxylate production. A drawing of the Caustic Storage Tank is shown below:

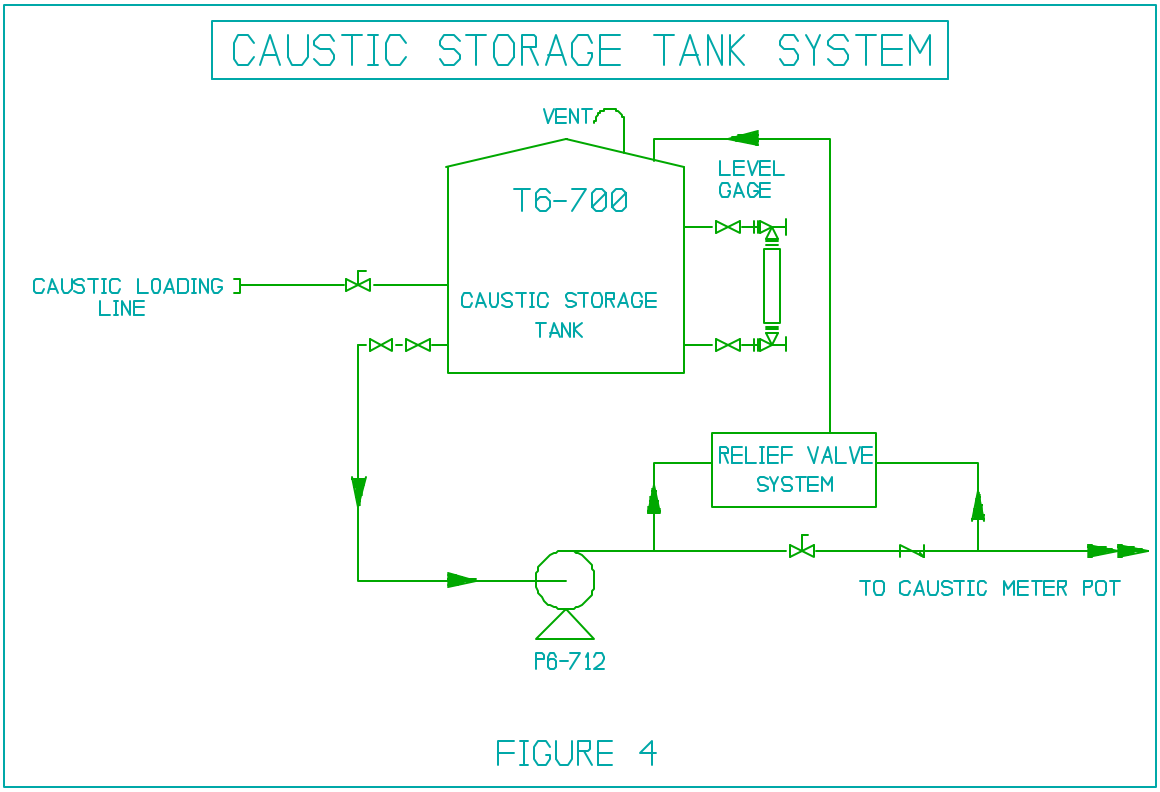


FIGURE 4

Physical Description - Equipment # T6-700

Operating Pressure - Atmospheric

Operating Temperature - 80 -120 °F

Transfer Method - Pump P6-712

4.1 REACTION SYSTEM SAFETY, continued

The Ethylene Oxide line has three valves; a hand operated two (2) inch ball valve, a safety valve (Robot-Arm) and the Ethylene Oxide Control valve.

The one (1) inch ball valve is opened first, then the safety (Robot-Arm) is set. These two valves are located downstream of the Ethylene Oxide control valve. As air pressure is slowly applied to the control valve, Ethylene Oxide is introduced into the Reactor.

Ethylene Oxide mixes with the alcohol near the bottom of the Reactor and close to the agitator for more efficient dispersion.

Unreacted Ethylene Oxide gas builds up pressure in the vapor space as the level rises in the Reactor. The pressure in the Ethylene Oxide (EO) storage tank is maintained at 45 psig. This is the driving pressure for moving the EO from storage to the Reactor. As the pressure reaches about 30 psig in the Reactor, nitrogen and Ethylene Oxide vapors are automatically vented slowly to atmosphere through PRC-1.

When the preset total weight is reached, the Ethylene Oxide control valve is closed manually, the safety valve (Robot-Arm) is automatically closed and the two (2) inch ball valve is manually closed. A nitrogen purge is flowed through the EO sparger and the reaction mass is stirred for about ten (10) minutes.

After the Ethylene Oxide is completely transferred to the Reactor, the Ethoxylate is pumped to the Cool Down Reactor. The cooling water supply and return lines are now closed, and the exchanger (EA-2) is drained to grade and blown out through the condensate line with nitrogen.

To maintain the final reaction temperature in the cool down vessel, the reaction mass is sent through heater/cooler (EA-2) and the reaction mass is circulated and stirred. At the completion of post stirring, the remaining steam is blown down through the condensate line. Finally the vapor space is purged for about 30 minutes with nitrogen.

The final Cool Down phase involves opening and closing several valves manually. Specific field training is required to become familiar with valve locations and alignment positions.

The following section 4.2,. illustrates simplified diagrams of the Reactor and Cool Down equipment systems described above.

4.2 EQUIPMENT DESCRIPTIONS that follow describe basic flow patterns and dimensional data of the Reactor system. The nitrogen system is not shown on drawing (Figure 6) for clarity. Nitrogen purge, however, is readily available to all major Reactor lines and equipment systems.

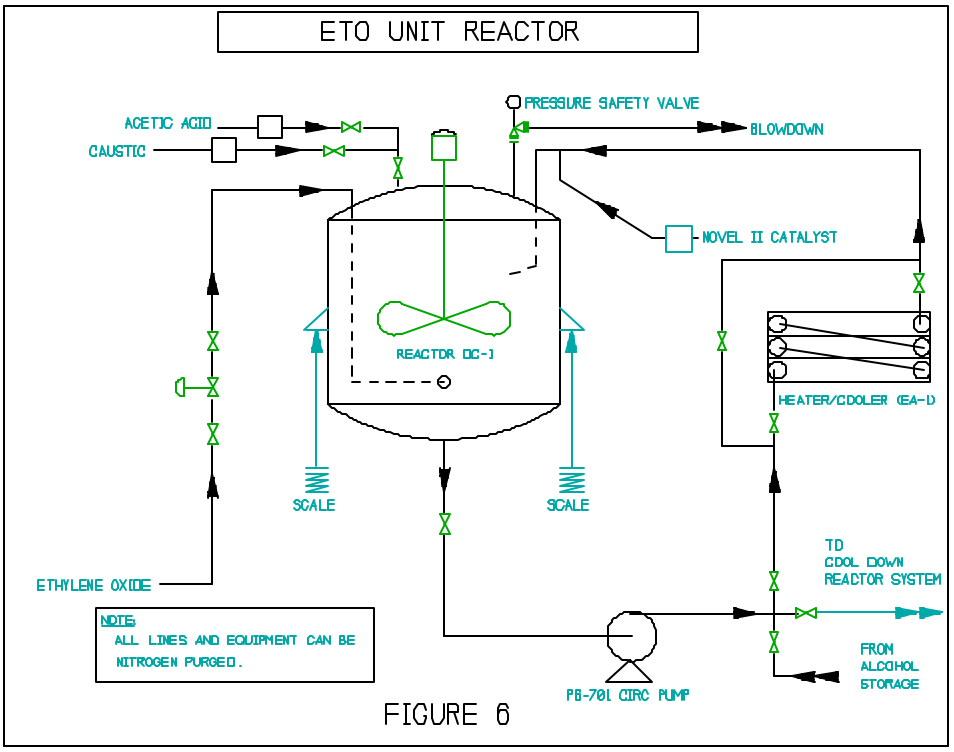


FIGURE 6

PHYSICAL DESCRIPTION - Ethoxylation Reaction Vessel. Agitated by A6-706
DIMENSIONS - Diameter: 8 feet; Height: 9.5 feet

CAPACITY - 25000 lbs. (7000 lbs., Alcohol+ 18000 E.O)

OPERATING PRESSURE - 30-40 psig

OPERATING TEMPERATURE - 300-360 °F

TRANSFER METHOD - Pump P6-701

4.2 The **EQUIPMENT DESCRIPTIONS** that follow describe basic flow patterns and dimensional data for the Cool Down Reactor system. The nitrogen system is not shown on drawing (Figure 7) for clarity. Nitrogen purge, however, is readily available to all major Reactor lines and equipment systems.

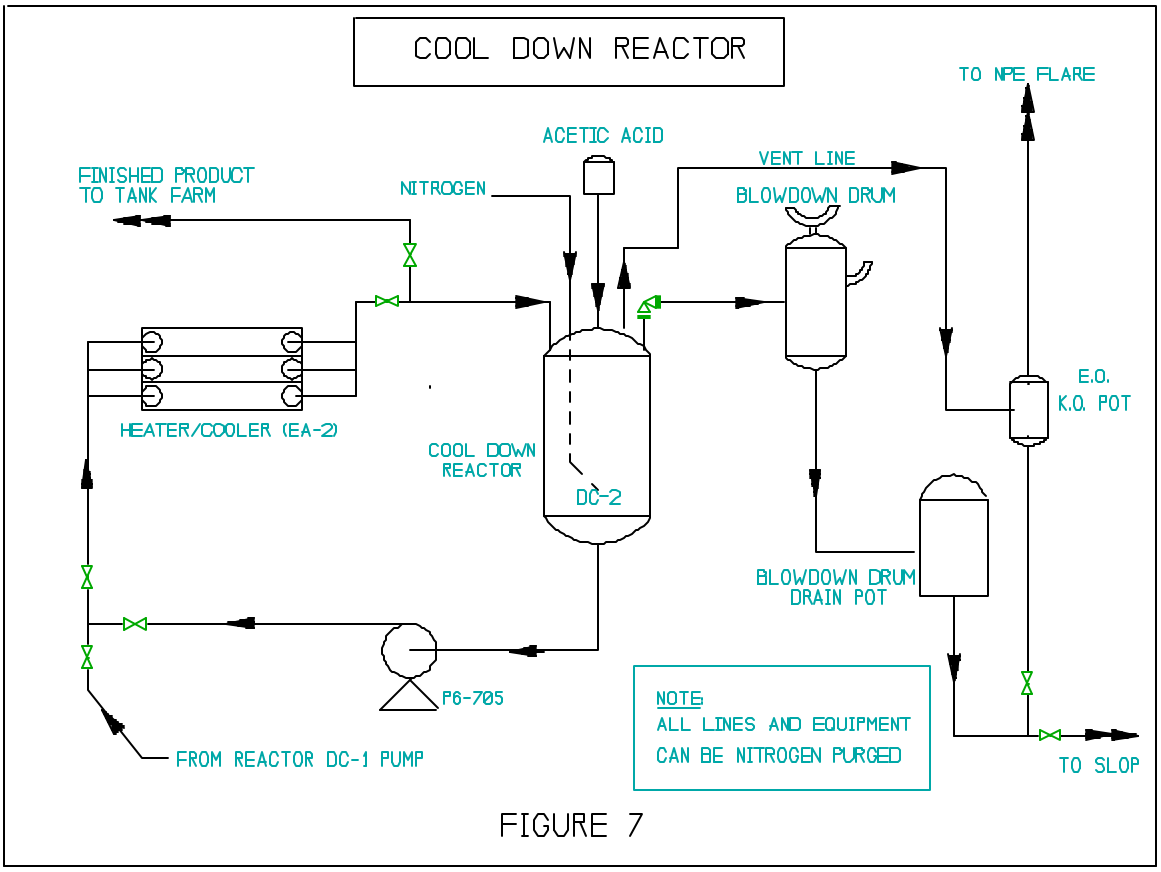


FIGURE 7

PHYSICAL DESCRIPTION - Vertical Weigh Scale Mounted Ethoxylation Reactor

DIMENSIONS - Diameter - 8 feet; Height - 9.5 feet

OPERATING PRESSURE - 20-50 psia

OPERATING TEMPERATURE - 120-355 °F

TRANSFER METHOD - Nitrogen Pressure

TABLE 1

ALARM SETPOINTS AND OPERATOR RESPONSE

Group # 23

Alarm	Alarm Setpoint	Probable Cause	Operator Response
J-603 Reboiler Pump Seal Pressure High (PAH-3)	10 PSI	Pump Seal Failure	Start Alternate Pump (J-603A), Stop J-603
		Faulty Instrumentation	Start Alternate Pump (J-603A, Stop J-603, Notify Instrumentation
J-603A Reboiler Pump Seal Pressure High (PAH-3A)	10 PSI	Pump Seal Failure	Start Alternate Pump (J-603), Stop J-603A
		Faulty Instrumentation	Start Alternate Pump (J-603), Stop J-603A, Notify Instrumentation
JC-606A Low Lube Oil Press (PAL-101A)	10 PSI	Low oil level	Check oil level, fill as required
		Filter dirty	Check filter differential pressure, change filter element as needed
		Leak in lubrication system	Inspect for Leaks
JC-606B Low Lube Oil Press (PAL-101B)	10 PSI	Low oil level	Check oil level, fill as required
		Filter dirty	Change filter element

TABLE 1

ALARM SETPOINTS AND OPERATOR RESPONSE

		Leak in lubrication system	Inspect for leaks

TABLE 2

CONSEQUENCES OF DEVIATION

Group # 23

Critical Parameter (Control Device)	Operating Range	Consequence of Deviation	Operator Response
E-601 Stabilizer Overhead Temperature	370° - 390° F	**LOW TEMPERATURE** Product Increases in H_2 Low Level in Overhead Receiver Reflux Pump Cavitation	**LOW TEMPERATURE** 1. Increase Fuel to B-602 2. Stop Reflux Pump 3. Lower Tower Pressure
		HIGH TEMPERATURE Flood F-606 Overhead Receiver Flood F-603/604/605 Drums Compressor Shut Down Unit Shut Down	**HIGH TEMPERATURE** 1. Decrease Fuel to B-602 Furnace 2. Increase Reflux 3. Raise Tower Pressure

TABLE 3

PROCESS INTERLOCKS

Process Section: **Blend Oil Hydrotreater**

Critical Parameter	Control Device	Indicator	Setpoint	Automatic Action
JC-606A Compressor Frame Oil Pressure Low (PAL-100A)	PIC-100A	PALSD-100A	10 PSI	Trips Solenoid Open, Shuts Down Compressor
JC-606B Compressor Frame Oil Pressure (PAL-100B)	PIC-100B	PALSD-100B	10 PSI	Trips Solenoid Open, Shuts Down Compressor
F-604 Recycle First Stage Flash Drum Level	LC-609	LHSD-12	90%	Trips Solenoid Open, Shuts Down Compressor
F-601 Make Up Gas Suction Drum Level	LC-603	LHSD-2	90%	Trips Solenoid Open, Shuts Down Compressor
F-602 Make Up Gas First Stage Knock Out Drum Level	LC-608	LHSD-6	90%	Trips Solenoid Open, Shuts Down Compressor

TABLE 4

TROUBLESHOOTING

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
E-601 Stabilizer Overhead High/Low Temperature	B-602 Reboiler Heater Temperature High/Low Excessive Reflux Loss of Reflux	1. Increase/Decrease Furnace B-602 Temperature (TIC-3) 2. Increase/Decrease Flow Through C-607 (FIC-17) 3. Check Level in F-606 Overhead Receiver
B-602 Stabilizer Reboiler Heater High/Low Temperature	TCV-3 Failure FCV-17 Failure J-602/A Pump Failure	1. Adjust/by-pass TCV-3 2. Adjust/by-pass TCV-17 3. Re-start/Swap J-602/A Pumps

O-SOP 311-508.0	Receiver Maintenance/Inspection Preparation		
	Eff. Date: May 20, 2003	Exp. Date: N/A	**Page 1 of 6**
	Superseded Procedure: New	Department: OPS	

1.0. PURPOSE:

The purpose of this procedure is to remove the following overhead receivers from service to support maintenance/inspection activities, and return them to service upon completion of the required activities:

Title	Section
F-201 Feed Splitter Overhead Receiver	6.1
F-202 Stripper Column Overhead Receiver	6.2
F-203 Recovery Column Overhead Receiver	6.3
F-204 Benzene Column Overhead Receiver	6.4

2.0. PREREQUISITES:

2.1. Schedule overhead receiver for maintenance/inspection.

2.2. Review blinding requirements.

2.3. Ensure adequate Nitrogen supply is available.

2.4. Notify other affected units of normal unit shutdown.

2.5. Perform Sulfolane Unit shutdown in accordance with SOP-311-104, Normal Unit Shutdown.

3.0. REQUIRED EQUIPMENT:

3.1. Drager Test Assembly with Benzene tube

3.2. Approved Air Respirator

4.0 SAFETY:

4.1 When performing this procedure there is a potential for exposure to Benzene. Extreme caution should be exercised at all times and the "Fresh Air Procedure" must be followed as established in ABC's Safety Manual.

4.2. When isolating lines, vessels and equipment, special precautions and procedures, including a Safe Work Permit, may be required. Particular atention must be paid to opening of equipment which may contain Nickel Carbonyl, Carbon Monoxide, Benzene, Nitrogen, or other haxardous gases.

Written/Revised By:	**Date**
Approved By:	**Date:**

O-SOP 311-508.0	Receiver Maintenance/Inspection Preparation		
	Eff. Date: May 20, 2003	Exp. Date: N/A	**Page 2 of 6**
	Superseded Procedure: New	Department: OPS	

5.0. REFERENCES:

5.1. SOP-311-104, Normal Unit Shutdown

5.2. ABC Safety Manual

5.3. Process Flow Diagram (PFD) A-92929 Sulfolane Unit Process Flow

6.0. F-201 FEED SPLITTER OVERHEAD RECEIVER

6.1. Removing F-201 Feed Splitter Overhead Receiver From Service

6.1.1. SHUT DOWN Sulfolane Unit in accordance with SOP-311-104, Normal Unit Shutdown.

6.1.2. BARRICADE job site as per ABC Safety Manual.

6.1.3. DRAIN liquid contents of receiver to solvent sump.

6.1.4. LOCKOUT JP-245A/B Feed Splitter Reflux Pump motors in accordance with ABC Safety Manual, "Electrical Lockout Procedure".

6.1.5. VERIFY motor is deenergized by attempting to start using local/remote start/stop switch.

6.1.6. CLOSE, LOCK AND TAG with "DANGER - DO NOT OPERATE" tags, valves indicated in Table 1 "Isolation Position" column. Table 1 is located at the end of this procedure.

CAUTION:

There is a potential for exposure to unknown concentrations of Benzene when opening the process to atmosphere. An approved air respirator is required to be worn when performing STEP 6.1.7.

6.1.7. PURGE receiver with Nitrogen.

6.1.7.1. OPEN Nitrogen supply valve and pressure receiver to equal Nitrogen pressure.

6.1.7.2. DEPRESSURE receiver by opening PSV-204 bypass valve to flare.

6.1.7.3. CLOSE PSV-204 bypass valve and allow receiver to equal Nitrogen pressure once again.

6.1.7.4. DEPRESSURE receiver by opening PSV-204 bypass valve to flare.

6.1.7.5. CLOSE Nitrogen supply valve.

6.0. F-201 FEED SPLITTER OVERHEAD RECEIVER

6.1. Removing F-201 Feed Splitter Overhead Receiver From Service

6.1.7. PURGE receiver with Nitrogen. (Continued)

6.1.7.6. CONDUCT Drager test for benzene. Check Vessel for Explosive gasses. Continue purging operations until no Benzene or explosive gases are present.

6.1.7.7. CLOSE Nitrogen supply valve and tag with "DANGER - DO NOT OPERATE" tag.

6.1.7.8. CLOSE flare PSV-204 bypass valve

6.1.8. Have maintenance INSTALL blinds per Master Blind List.

6.1.9. OPEN receiver drain bleeder and TAG with "DANGER - DO NOT OPERATE" tag.

6.1.10. OPEN receiver vent bleeder and TAG with "DANGER - DO NOT OPERATE" tag.

6.1.11. OPEN steam supply valve and steam receiver to Oily Water Sewer.

6.1.12. When no resids appear in steam, CLOSE, LOCK AND TAG steam supply valve with "DANGER - DO NOT OPERATE" tag.

6.1.13. ALLOW receiver to cool.

6.1.14. PREPARE receiver in accordance with ABC Safety Manual, "Confined Space Entry" requirements.

6.1.15. NOTIFY Console Operator and Chief Operator that receiver is ready for maintenance.

6.2. Returning F201 Overhead Receiver to Service

6.2.1. VERIFY receiver has been pressure tested.

6.2.2. Have maintenance REMOVE blinds per Master Blind List.

6.2.3. NOTIFY Chief Operator and Console Operator that receiver maintenance/inspection is complete.

6.0. F-201 FEED SPLITTER OVERHEAD RECEIVER

6.2. Returning F201 Overhead Receiver to Service. (Continued)

6.2.4. REMOVE "DANGER - DO NOT OPERATE" tags from the following:

6.2.4.1. Drain bleeder

6.2.4.2. Vent bleeder

6.2.5. CLOSE the following valves:

6.2.4.1. Drain bleeder

6.2.4.2. Vent bleeder

6.2.6. Nitrogen PURGE drum to remove oxygen as follows:

6.2.6.1. OPEN Nitrogen supply valve and pressurize drum to equal Nitrogen pressure.

6.2.6.2. DEPRESSURIZE receiver by opening PSV-204 bypass to flare.

6.2.6.3. CLOSE PSV-204 bypass valve and allow receiver to equal Nitrogen pressure once again.

6.2.6.4. DEPRESSURE receiver by opening PSV-204 bypass valve to flare.

6.2.6.5. CLOSE Nitrogen supply valve.

6.2.6.6. OBTAIN analysis of gas at the most downstream bleed points of the vessel to determine percentage of oxygen remaining in system.

6.2.6.7. If oxygen content is above 0.5%, CONTINUE PURGING with Nitrogen until test results are below 0.5% oxygen.

6.2.6.8. CLOSE Nitrogen supply valve and TAG with "DANGER - DO NOT OPERATE" tag.

6.2.6.9. CLOSE flare PSV-204 bypass valve.

6.0. F-201 FEED SPLITTER OVERHEAD RECEIVER

6.2. Returning F201 Overhead Receiver to Service. (Continued)

6.2.7. UNLOCK and REMOVE "DANGER - DO NOT OPERATE" tags and POSITION valves as indicated in Table 1 "Normal Position" column.

6.2.8. UNLOCK JP-245A/B Feed Splitter Reflux Pump motor in accordance with ABC Safety Manual, "Electrical Lockout Procedures".

> NOTE:
>
> If wires were disconnected on the motor, perform step 6.2.9. If wires were not disconnected proceed to step 6.2.10.

6.2.9. QUICK START/QUICK STOP motor to verify proper rotation.

6.2.10. REMOVE barricade from job site area.

6.2.11. ENSURE job site is clean.

6.2.12. NOTIFY Console Operator and Unit Supervisor that receiver is ready to be returned to service.

7.0. Removing F-202 Stripper Column Overhead Receiver From Service.

0 O 0

Loss of Electrical Power

1.0. PURPOSE:

The purpose of this procedure is to provide immediate and supplementary actions for a total loss, or partial loss, of electrical power to the Sulfolane Unit.

2.0. INITIAL INDICATIONS:

2.1. Motor shutdown alarms on all pumps.

2.2. Loss of unit lighting.

2.3. A sustained loss of electrical power (5 seconds or more).

3.0. SAFETY:

3.1. There is a potential for overpressuring the unit when power is lost. Closely monitor unit pressure and temperatures to reduce the possibility of overpressuring the unit.

Written/Revised By:	**Date**
Approved By:	**Date:**

4.0. REFERENCES:

4.1. P&ID's as follows:

4.1.1. A-36677 ABC Sub 13.8KV Key One-line Diagram

4.1.2. A-36767(Sheet 1) Sub No. 25 & 28 Electrical Distribution System

4.1.3. A-36767(Sheet 2) Sub No. 25 & 28 Electrical Distribution System

4.2. Procedures as follows:

4.2.1. EOP-311-201, Emergency Shutdown

4.2.2. EOP-311-202, Start-up Following Emergency Shutdown

4.3. ABC Safety Manual

Loss of Electrical Power

5.0. PROCEDURE:

5.1. Immediate Actions for Total Loss of Electrical Power

5.1.1. ESTABLISH radio contact between Console Operator, Chief Operator and Outside Operator.

5.1.2. VERIFY furnaces shut down.

5.1.3. CLOSE the following fuel gas control valves:

5.1.3.1. FV-208, B-201 Furnace

5.1.3.2. FV-220, B-202 Furnace

5.1.4. CLOSE the following fuel gas isolation valves:

5.1.4.1. FV-208 block valves, B-201 Fuel Gas supply

5.1.4.2. FV-220 block valves, B-202 Fuel Gas supply

5.1.5. VERIFY pumps shown in tables 1 through 4, located at the end of this procedure, have stopped.

5.1.6. PLACE local start/stop switches for pumps shown in tables 1 through 4, located at the end of this procedure, in the "STOP" position.

5.2. Supplementary Actions for Total Loss of Electrical Power

5.2.1. ATTEMPT to maintain operating levels in columns and drums.

5.2.2. MONITOR and secure unit operations and equipment per EOP-311-201 "Emergency Shutdown" procedure.

5.2.3. CONTACT Electrical Department to investigate cause of problem.

5.2.4. When power is restored, START UP unit in accordance with EOP-311-202 "Start-up Following Emergency Shutdown".

Loss of Electrical Power

5.0. PROCEDURE: **(Continued)**

5.3. Immediate Actions for Total Loss of Transformer TR-1

5.3.1. ESTABLISH radio contact between Console Operator, Chief Operator and Outside Operator.

5.3.2. VERIFY pumps shown in Tables 1, located at the end of this procedure, have stopped and PLACE local start/stop switches in the "STOP" position..

5.3.3. START pumps shown in Table 2, located at the end of this procedure, if not already in service.

> Note:
>
> If only one Lean Solvent Pump is running, the charge rate must be reduced.

5.4. Supplementary Actions for Total Loss of Transformer TR-1

5.4.1. CONTACT Electrical Department to have them investigate cause of problem.

5.4.2. When power is restored, RETURN pumps and unit to normal configuration.

5.5. Immediate Actions for Total Loss of Transformer TR-2

5.5.1. ESTABLISH radio contact between Console Operator, Chief Operator and Outside Operator.

5.5.2. VERIFY pumps shown in Table 2, located at the end of this procedure, have stopped and place local start/stop switches in the "STOP" position.

> Note:
>
> Both Lean Solvent Pumps should be started in the next STEP.

5.5.3. START pumps shown in Table 1, located at the end of this procedure, if not already in service.

5.0. PROCEDURE: (Continued)

5.6. Supplementary Actions for Total Loss of Transformer TR-2

5.6.1. CONTACT Electrical Department to investigate cause of problem.

5.6.2. When power is restored, RETURN pumps and unit to normal configuration.

5.7. Immediate Actions for Total Loss of Transformer TR-3

5.7.1. ESTABLISH radio contact between Console Operator, Chief Operator and Outside Operator.

5.7.2. VERIFY pumps shown in Table 3, located at the end of this procedure, have stopped and PLACE local start/stop switches in the "STOP" position.

5.7.3. START the following pumps, if not in service:

5.7.3.1. JP-246A Stripper Overhead Water Pump

5.7.3.2. JP-266A Benzene Product Pump

5.7.3.3. JP-268A High Pressure Condensate Pump

5.7.3.4. JP-245B Feed Splitter Reflux Pump

5.8. Supplementary Actions for Total Loss of Transformer TR-3

5.8.1. CONTACT Electrical Department to investigate cause of problem.

5.8.2. When power is restored, RETURN pumps and unit to normal configuration.

5.9. Immediate Actions for Loss Of Transformer TR-4

5.9.1. SHUTDOWN Unit in accordance with EOP-311-201, "Emergency Shutdown" procedure.

5.0. PROCEDURE: (Continued)

5.10. Supplementary Actions for Total Loss of Transformer TR-4

5.10.1. CONTACT Electrical Department to investigate cause of problem.

5.10.2. When power is restored, START UP unit in accordance with EOP-311-202 "Start-up Following Emergency Shutdown".

Loss of Electrical Power

Table 1

SULFOLANE ELECTRICAL EQUIPMENT LIST
SUBSTATION 28/TRANSFORMER - 1
2.4KV BUS

Equipment
JP-244B Feed Splitter Bottoms Pump
JP-248C Lean Solvent Pump
JP-248B Lean Solvent Pump

Table 2

SULFOLANE ELECTRICAL EQUIPMENT LIST
SUBSTATION 28/TRANSFORMER - 2
2.4KV BUS

Equipment
JP-248A Lean Solvent Pump
JP-248B Feed Splitter Bottoms Pump

Table 3

SULFOLANE ELECTRICAL EQUIPMENT LIST
SUBSTATION 28/TRANSFORMER - 3
2.4KV BUS

Equipment
JP-245A Feed Splitter Reflux Pump
JP-249B Recovery Column Overhead Pump
JP-247A Extractor Recycle Pump
JP-267B Raffinate Product Out Pump

Table 4

SULFOLANE ELECTRICAL EQUIPMENT LIST
SUBSTATION 28/TRANSFORMER - 4
480V BUS, BENZENE SWRK - 2

Equipment
JP-243A Extractor Charge Pump
JP-254B Water Stripper Bottoms Pump
JP-255A Water Still Overhead Pump
JP-256B Stripper Bottoms Pump
JP-257A Ejector Condensate Pump
JP-259A Anti-foam Injection Pump

OJT-111-208 **REVISION: 0**

Name:_____ Job Position: CO1

Badge No: _____ Issue Date:_____

ON-THE-JOB TRAINING CHECKLIST

Utilities - "B" Reformer Unit

INSTRUCTIONS:

1. OJT Trainers shall be designated by XYZ Management.
2. Entries shall be made in ink. Any errors shall be corrected with a single line strike-out and with initials above.
3. OJT Trainer shall demonstrate to the trainee all tasks within the scope of this OJT checklist.
4. Trainee shall be given adequate time to practice tasks prior to the performance evaluation.
5. Safety shall always be the primary consideration. The OJT Trainer shall review all applicable Safety requirements with trainee prior to commencing training.
6. The following abbreviations are the action requirements associated with the performance evaluation:

   P - Perform (preferred method)

   S - Simulate

   O - Observe

7. The OJT Trainer shall circle the appropriate abbreviation in the "action block" when two or more evaluation options are available, placing date and initials beside each task when trainee has satisfactorily completed the associated Performance Evaluation.
8. Upon successful completion of all OJT Checklist items, an interview shall be conducted by the Unit Supervisor or designee.

   a. It shall be determined if all items on the OJT Checklist have been adequately demonstrated with the trainee indicating this by completing the "Trainee Signature" block in the Final Interview Section.

   b. After successful completion of the interview, Unit Supervisor or designee shall complete the "Unit Supervisor's Signature" block indicating that all training requirements and evaluations have been satisfied.

Name:_____ Badge No: _____

ON-THE-JOB TRAINING CHECKLIST

Utilities - "B" Reformer Unit

SCOPE:

This checklist addresses the performance requirements for the following, as applicable to Chief Operator (CO1):

a. Placing Utility Systems in service

b. Removing Utility Systems from service

PREREQUISITES:

1. Completed On-The-Job Training Routine Tasks 203 Checklist

REQUIRED REFERENCES:

1. XYZ Safety Manual
2. "C" Reformer Unit Operating Manual
3. Standard Operating procedures as follows:

   a. SOP-327-401, Utility Systems Checklists

   b. SOP-327-308, Cooling Tower Operations

   c. SOP-327-309, Flare Operations

KNOWLEDGE REQUIREMENTS:

1. Locate and identify all equipment which uses the following utilities:

   a. Cooling Water

   b. 250 lb Steam

Name:_____ Badge No: _____

ON-THE-JOB TRAINING CHECKLIST

Utilities - "B" Reformer Unit

KNOWLEDGE REQUIREMENTS:

1. Locate and identify all equipment which uses the following utilities: (Continued)

   c. Nitrogen

   d. Instrument Air System

   e. Plant Air System

2. Given a list of potential hazards associated with the utility systems, identify characteristics, safety requirements and personal protective equipment for handling such hazards.

3. Given the appropriate P&ID, identify the valves which are used to place the cooling water system in service.

4. Given the appropriate P&ID, identify the equipment served by the instrument air system.

Name:_____ Badge No: _____

ON-THE-JOB TRAINING CHECKLIST

Utilities - "B" Reformer Unit

PERFORMANCE REQUIREMENTS

		ACTION	*DATE*	*INITIALS*
1.	Coordinate placing Cooling Water System in service per SOP-327-401 "Utility Systems":	P,S		
	a. Verify line-up Cooling Water supply/return valves			
	b. Start Cooling Water circulation			
	c. Establish Cooling Water flow to Unit Cooling Water Exchangers			
2.	Coordinate removing Cooling Water System from service per SOP-327-401 "Utility Systems":	P,S		
	a. Stop Cooling Water circulation			
	b. Verify Cooling Water supply/return valves closed			
	c. Verify Exchanger(s) have been drained			
3.	Coordinate placing Well Water System in service	P,S		
4.	Coordinate removing Well Water System from service	P,S		
5.	Coordinate placing Instrument Air System in service	P,S		
6.	Coordinate removing Instrument Air System from service	P,S		
7.	Coordinate placing Plant Air System in service	P,S		
8.	Coordinate removing Plant Air System from service	P,S		
9.	Coordinate placing Nitrogen System in service	P,S		
10.	Coordinate removing Nitrogen System from service	P,S		

Name:_____ Badge No: _____

ON-THE-JOB TRAINING CHECKLIST

Utilities - "B" Reformer Unit

			ACTION	DATE	INITIALS
11.	Coordinate placing 600 lb Steam System in service per SOP-327-312:		P,S		
	a.	Line-up 250 lb Steam supply			
	b.	Line-up 600 lb Steam to (L-510)			
		1) Establish Steam Drum operating level			
		2) Warm-up Steam Generation System			
		3) Swap from 250 lb Steam to 600 lb Steam			
12.	Coordinate removing 600 lb Steam System from service per SOP-327-312:		P,S		
	a.	Prepare for Unit Cooldown			
	b.	Open L-510 when Steam pressure drops to 350 lbs			
	c.	Open 250 lb Start-up Steam block valve			
	d.	Swap to 250 lb Steam			
	e.	Open 250 lb Start-up Steam to F-531 block valve			
	f.	Block-in TIC-531 Desuperheater valves			
	g.	Close L-510 600 lb Start-up Silencer block valve			
	h.	Close 250 lb Start-up Steam to F-531 block valve			
	i.	Shut down Boiler Feed Water System			
	j.	Shut down Deareator			
	k.	Shut down Blowdown Drum			
13.	Coordinate placing Condensate System in service		P,S		
14.	Coordinate removing Condensate System from service		P,S		
15.	Coordinate placing Fuel Gas System in service		P,S		
16.	Coordinate removing Fuel Gas System from service		P,S		

Name:_____ Badge No: _____

ON-THE-JOB TRAINING CHECKLIST

Utilities - "B" Reformer Unit

			ACTION	*DATE*	*INITIALS*
l7.	Coordinate placing Flare System in service per SOP-327-309:		P,S		
	a.	Verify line-up, Fuel gas to Flare Pilots			
	b.	Verify line-up, Air to Flare Pilots			
	c.	Coordinate lighting Flare Pilots			
	d.	Verify Fuel Gas purge to Flare from Unit			
	e.	Verify line-up 250 lb Steam to Flare Tip			
	f.	Establish liquid seal on Flare Stack			
18.	Coordinate removing Flare System from service per SOP-327-309:		P,S		
	a.	Well Water to Flare liquid seal is closed			
	b.	Verify Fuel gas purge to Flare from Unit is closed			
	c.	250 lb Steam to Flare Tip is closed			
	d.	Fuel Gas to Pilots closed			
	e.	Air to Pilots closed			

Name:_____ Badge No: _____

ON-THE-JOB TRAINING CHECKLIST

Utilities - "B" Reformer Unit

FINAL INTERVIEW

The tasks addressed within the Scope of this OJT Checklist were satisfactorily demonstrated prior to my performance evaluation.

_____ _____
(Trainee's Signature) (Date)

Comments: _____

_____

_____

_____

Trainee has successfully completed all tasks within the scope of this OJT Checklist and all training requirements and evaluations have been satisfied.

_____ _____
(Unit Supervisor's Signature) (Date)

Comments: _____

_____

_____

_____