PLAINTIFF'S EXHIBIT

TEX-28

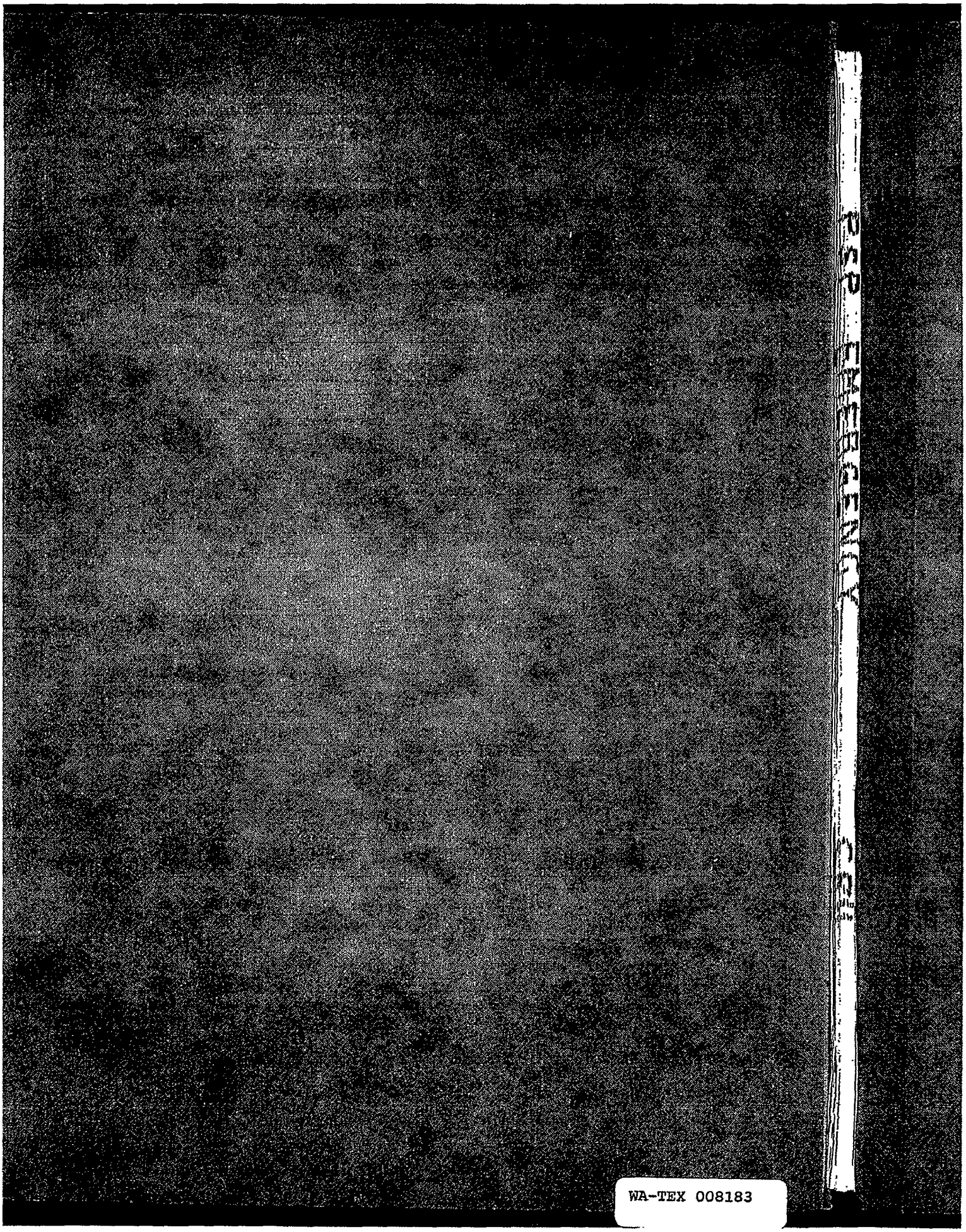
CRU & HTU

EMERGENCY PROCEDURES

PUGET SOUND PLANT

WA-TEX 008182

WA-TEX008182



WA-TEX 008183

WA-TEX008183

EMERGENCY PROCEDURES

TEXACO INC.

PLANT: PUGET SOUND DATE: DECEMBER 1971
DEPARTMENT: CRU & HTU
OPERATION: EMERGENCY PROCEDURES INDEX

EMERGENCY PROCEDURES

TEXACO INC.

PLANT: PUGET SOUND DATE: DECEMBER 1971
DEPARTMENT: CRU & HTU
OPERATION: EMERGENCIES IN GENERAL

All Operators:

1. The operation of the unit is dependent upon a constant source of supply of various utilities, and equipment. Therefore, it is very important that the source of utilities and equipment be watched very closely.

2. The purpose of emergency procedures is to prepare each operator with the knowledge of what action can best be taken to keep the units running, or to try to maintain the unit in a safe condition when any of these utilities or pieces of equipment are lost or when the units have to be shut down.

3. We would also like to keep the unit as near ready for restart-up as possible.

4. Each Operator A is responsible to know the duties of each man in his crew. He is also responsible to see that each man in his crew is thoroughly familiar with his duties. The Operator A is also to direct and co-ordinate the activities of his crew.

5. When confronted with an actual emergency, quickly analyze the situation and the type of emergency.

   NOTE: Time is a factor in many emergencies, however, a moment spent in analyzing the situation may save time and avoid errors. Keep Calm!!

6. Call for assistance as soon as possible; notify the Foreman or Night Foreman what is needed.

7. Notify other departments that will be affected by the emergency, as soon as possible.

8. Maintain hydrogen circulation on reactor systems, if possible.

EMERGENCY PROCEDURES

TEXACO INC.

PLANT: PUGET SOUND
DEPARTMENT: CRU & HTU
OPERATION: EMERGENCIES IN GENERAL

DATE: DECEMBER 1971

All Operators: (Cont.)

9. If fire danger is present, pump out oil as quickly as possible through the emergency cooling box to the emergency tank or off-test header to the slop tank and depressure the system that is affected to flare system.

10. It is the responsibility of each Operator to keep Operator A informed of any change of condition that would effect a safe shutdown or would be necessary to go a different route or procedure.

EMERGENCY PROCEDURES

TEXACO INC.

PLANT: PUGET SOUND DATE: DECEMBER 1971
DEPARTMENT: CRU & HTU
OPERATION: HEATER TUBE FAILURE IN DEBUTANIZER SECTION OF 6D-F1 HEATER

MAKE SURE WHAT SECTION OF THE HEATER HAS TUBE FAILURE! CHECK!

Operator A:

1. It is the responsibility of Operator A to know the duties of each member of his crew and direct and co-ordinate the procedure that you have decided to follow.
2. The HTU and CRU must be shutdown.
3. If the tube leak is small and the temperature can be controlled in 6D-F1 heater, units can be shut down in a more normal manner.
4. Check over pressures and temperatures and rates to determine the location of the tube failure.
   a. If pressure is holding on the CRU reactor system, then reactor section of heater is okay.
   b. If bottoms' rate and O. H. gas rate on the Debutanizer tower has dropped off, it would appear a tube failure is evident in the Debutanizer Charge Coil section of the heater.
5. Have fuel gas cut back to a minimum in 6D-F1 heater.
   a. Have fuel oil shut off if in service in 6D-F1 heater.
   b. Cut fires back on 7C-F1 heater to hold 600°F outlet temperature.
   c. Stop charge to CRU and HTU reactors.
   d. Cut out fires in 7C-F2 and 7C-F3 heaters and cut in safety steam.
   e. Block in charge regulators on CRU and HTU.

EMERGENCY PROCEDURES

TEXACO INC.

PLANT: PUGET SOUND DATE: DECEMBER 1971
DEPARTMENT: CRU & HTU
OPERATION: HEATER TUBE FAILURE IN DEBUTANIZER SECTION OF 6D-F1 HEATER

Operator A: (Cont.)

6. Maintain hydrogen gas circulation on both reactor systems. Lower speed on 6D-K1 compressor to 7000 RPM also 7C-K1 compressor.

7. Shut down 6D-G2 absorber bottoms pump.

   a. Close control valve 6FRC-25.

   b. Put steam into Debutanizer feed line.

   c. Close Debutanizer feed block valve at tower.

8. When able, block off fuel gas and fuel oil to 6D-F1 heater and start safety steam to fire box at a controlled amount.

   a. Have the Fire Company keep water on heater structure for cooling.

9. Shut down all recovery pumps where not needed and injection pumps and block in.

   a. When time permits, slop all product streams.

   b. Close hot HSR Naphtha to CRU charge drum.

   c. Shut off stripping steam to Rerun tower stripper.

   d. Shut down 7C-K2 compressor when no longer needed.

10. Keep Recycle Gas Compressors operating until all charge from reactor systems has been cleared and fire is out of 6D-F1 heater.

11. When 1½ hours of hydrogen gas circulation has finished on the HTU reactor system at 600°F and the temperature is below 600°F on the reactor outlet, cut fires out of 7C-F1 heater, all but one pilot fire, then shut down 7C-K1 compressor.

EMERGENCY PROCEDURES

TEXACO INC.

PLANT: PUGET SOUND DATE: DECEMBER 1971
DEPARTMENT: CRU & HTU
OPERATION: HEATER TUBE FAILURE IN DEBUTANIZER SECTION OF 6D-F1 HEATER

Operator A: (Cont.)

12. When the CRU reactor system has been cleared of charge and 6D-F1 heater fire is out, shut down 6D-F1 compressor and block in.

    a. Isolate reactor systems.

    b. Empty Product Separator.

    c. Depressure CRU reactor system to flare and purge out with Nitrogen in a normal routine manner.

    d. Hold hydrogen pressure on the HTU reactor system.

Operator B:

1. When directed by Operator A notify all departments that will be effected. (You can have someone in the Control Room do this job and also make the Fire Call.)

2. Cut fuel gas fires to a minimum in 6D-F1 heater.

    a. Shut off the fuel oil control valves.

    b. Lower 7C-F1 heater outlet temperature to 600°F.

    c. Reduce fires to a minimum in 7C-F2 and 7C-F3 heaters.

    d. Cut CRU and HTU reactor charge to ½ design charge rate.

    e. When charge is stopped, close control valves.

    f. Lower RPM to 7000 on 6D-K1 and 7C-K1 compressors.

    g. When 6D-G2 Absorber bottoms is shut down, close 6FRC-25 control valve.

    h. Hold levels in towers and drums.

EMERGENCY PROCEDURES

TEXACO INC.

PLANT: PUGET SOUND DATE: DECEMBER 1971
DEPARTMENT: CRU & HTU
OPERATION: HEATER TUBE FAILURE IN DEBUTANIZER SECTION OF 6D-F1 HEATER

Operator B: (Cont.)

2. (Cont.)

   1. Route Fractionator gas to flare system when 7C-K2 compressor is shut down.

3. Adjust reboiler heater control valves to cool down on CRU and HTU.

4. Maintain positive pressure on all towers, accumulators, and drums to prevent pulling a vacuum.

5. Notify Operator A when 1½ hours hydrogen circulation have been completed at 600°F on the HTU reactor system and reactor outlet temperature is below 600°F.

6. Continue hydrogen circulation on the CRU reactor system until approval has been given.

Operator Helper A:

1. Shut down HTU charge pump. Operator A can shut down the other charge pump.

   a. Cut fires out of 7C-F2 and 7C-F3 heaters and start safety steam.

   b. Cut back fires in 7C-F1 heater so Operator B can outlet.

   c. Shut off fuel oil and fuel gas to 6D-F1 heater.

2. Shut down Absorber bottoms pump.

   a. Assist in getting Debutanizer coil isolated and steaming.

3. Assist in shutting down recovery pumps when no longer needed and also the injection pumps.

4. Shut down 7C-K2 compressor.

5. When time permits, route all product streams to slop tank.

EMERGENCY PROCEDURES

TEXACO INC.

PLANT: PUGET SOUND DATE: DECEMBER 1971
DEPARTMENT: CRU & HTU
OPERATION: HEATER TUBE FAILURE IN DEBUTANIZER SECTION OF 6D-F1 HEATER

Operator Helper A: (Cont.)

6. Shut off stripping steam to rerun tower stripper.
7. Block in reactor systems.
8. Assist in getting CRU reactor system ready for repairs.
9. Assist in shutting down 7C-K1 compressor.

NOTE: The above steps are not a hard set of rules. It is best to discuss it with Operator A so both can work as a team and do the job safely.

EMERGENCY PROCEDURES

TEXACO INC.

PLANT: PUGET SOUND DATE: DECEMBER 1971
DEPARTMENT: CRU & HTU
OPERATION: 6D-F1 HEATER TUBE RUPTURE IN REACTOR SYSTEM SECTION

MAKE SURE WHAT SECTION OF 6D-F1 HEATER HAS TUBE FAILURE! CHECK!

Operator A:

1. It is the responsibility of Operator A to know the duties of each member of his crew and direct and co-ordinate the procedure that you have decided to follow.

2. Check over reactor system pressure and gas rates off Product Separator and also 6D-K1 compressor flow rate. If the pressure is dropping on the reactor system and hydrogen gas production is dropping, it would appear that the reactor section of the heater has the tube failure.

   a. The HTU and CRU must be shut down.

3. If the tube leak is small and the temperature can be controlled in 6D-F1 heater, units can be shut down in a more controlled manner.

4. If the tube rupture is large it will be necessary to bring both units down as quickly as possible and eliminate the source of fire.

5. Notify Operator B and the Helper what procedures is to be taken.

6. Stop charge to CRU and HTU.

   a. Cut out fires in 7C-F1, 7C-F2 and 7C-F3 heaters and start safety steam to these heaters. Reduce the fires to a minimum in 6D-F1 heater and shut off fuel oil fires (control board).

   b. Start a controlled amount of safety steam to the fire boxes, when possible. It is better to keep a fire burning in the heater while the system is being emptied.

   c. Trip out 6D-K1 turbine and isolate the CRU and HTU reactor systems from each other.

   d. Shut down 7C-K2 compressor when not needed.

EMERGENCY PROCEDURES

TEXACO INC.

PLANT: PUGET SOUND DATE: DECEMBER 1971
DEPARTMENT: CRU & HTU
OPERATION: 6D-F1 HEATER TUBE RUPTURE IN REACTOR SYSTEM SECTION

Operator A: (Cont.)

7. Depressure Product Separator to flare system and block in.

   a. Keep 7C-K1 recycle gas compressor circulating hydrogen if you have at least 50# of pressure on the system. If not, it will be necessary to shut down the compressor until hydrogen can be brought in from H^2 trailers.

8. Block in 6D-K1 compressor suction and discharge valves.

   a. Line up nitrogen to discharge line of 6D-K1 compressor. Make sure the CRU reactor system is isolated from recovery system.

   b. When the CRU reactor system is depressured to two or three pounds pressure, route nitrogen into 6D-K1 compressor discharge line and sweep out reactor system with flare system closed. You will push everything out the ruptured tube anyway if rupture is large. If the rupture is small and you are able to build pressure with nitrogen, then it would be better to route to the flare system off Product Separator.

   c. When discharge line on 6D-K1 compressor has been swept clear of Hydrocarbons into heater, reroute nitrogen to suction line of 6D-K1 compressor and sweep out reactors on reverse flow out ruptured tube in heater.

   d. If leak is small, disregard (c). and continue to sweep reactor system through discharge line of compressor until it is clear of hydrocarbons. Purge out 6D-K1 compressor with nitrogen.

9. Shut down all recovery pumps when no longer needed on the HTU and hold levels.

   a. Maintain debutanizer charge coil circulation if possible to keep coil from coking up as long as fire is in 6D-F1 heater.

EMERGENCY PROCEDURES

TEXACO INC.

PLANT: PUGET SOUND DATE: DECEMBER 1971
DEPARTMENT: CRU & HTU
OPERATION: 6D-F1 HEATER TUBE RUPTURE IN REACTOR SYSTEM SECTION

Operator A: (Cont.)

10. Empty Product Separator of liquid to sewer if no pumpout is available and wind direction is away from heater. Do this slowly and keep water hose on stream to sewer.

11. Slop all product streams when time permits.

    a. Make sure all injections are shut off and blocked in on the CRU and HTU.

    b. Shut off stripping steam to rerun tower stripper.

12. When time permits, if 7C-K1 compressor is in operation with a good flow of hydrogen, light fires in 7C-F1 heater and shut off safety steam. Bring up to 600 F heater outlet temperature and hold for 1½ hours to sweep out charge in reactor system, then shut off fires to 7C-F1 heater, all but one burner and leave it with a small pilot fire.

13. Shut down 7C-K1 compressor when the HTU reactor outlet temperature is below 600°F and time permits.

14. Have steam connected to the CRU reactor system at locations where provided. It may be necessary to have pipefitters called out for this job.

15. When nitrogen supply is nearly exhausted and permission has been given by the Foreman, route the steam into reactor system and shut off nitrogen. Steam until hydrocarbon has been removed from system or as directed by the Foreman.

16. Blind off all fuel gas to 7C-F2 and 7C-F3 heaters and stop safety steam to same.

    a. Block in fuel oil system to 6D-F1 heater.

    b. When fire heas been stopped on ruptured tube in 6D-F1 heater, close main fuel gas block valve and blind off.

    c. Keep safety steam going to 6D-F1 heater fire box until heater has cooled down.

EMERGENCY PROCEDURES

TEXACO INC.

PLANT: PUGET SOUND DATE: DECEMBER 1971
DEPARTMENT: CRU & HTU
OPERATION: 6D-F1 HEATER TUBE RUPTURE IN REACTOR SYSTEM SECTION

Operator A: (Cont.)

16. (Cont.)

    d. Shut down debutanizer charge coil circulation and isolate debutanizer tower from recovery system.

    e. Depressure debutanizer tower to flare and pump out oil and drain the reboiler.

    f. Start steaming out debutanizer tower and debutanizer charge coil to flare.

17. Follow the unit foreman's instructions on any additional items to be done.

Operator B:

1. When directed by Operator A, notify all departments that will be affected. (You can have someone in the control room do this job.) Also, make the fire call.

2. Cut fires back to minimum on all heaters and shut off fuel oil to 6D-F1.

3. Reduce charge to the CRU and HTU to a minimum. When the charge is out, close charge control valves.

4. Reduce RPM to lowest governor setting on both recycle gas compressors.

5. Adjust rates and make-up to maintain debutanizer charge coil circulation. Also, hold levels in all towers, accumulators, and drums.

6. Shut SR Naphtha charge booster pump down if it is coming directly from Tank 17 or 11 to the HTU. Leave it running if used for VPS outside reflux.

7. When 7C-K2 is shut down, route the Fractionator gas to the flare system.

EMERGENCY PROCEDURES

TEXACO INC.

PLANT: PUGET SOUND DATE: DECEMBER 1971
DEPARTMENT: CRU & HTU
OPERATION: 6D-F1 HEATER TUBE RUPTURE IN REACTOR SYSTEM SECTION

Operator B: (Cont.)

8. Adjust reboilers on strippers so they do not overheat.

9. When fires are relighted in 7C-F1 heater, adjust to hold at 600°F outlet temperature for 1½ hours.

10. Notify Operator A when 1½ hours hydrogen circulation has been completed and the HTU reactor outlet is below 600°F.

11. Be sure to maintain positive pressure on all towers, accumulators, and drums to prevent pulling a vacuum on same and cause damage.

12. When the debutanizer charge coil circulation is no longer needed, empty the debutanizer tower bottoms to the rerun tower and close off the control valve (if the debutanizer tower has enough pressure).

Operator Helper A:

1. Assist in shutting off the fires in 7C-F1, 7C-F2, and 7C-F3 heaters and cut in safety steam to these heaters.

   a. Shut down charge pumps (Operator A can shut down one pump and the Operator Helper A can shut down the other charge pump.)

   b. Trip out 6D-K1 compressor.

   c. Isolate reactor systems.

   d. Block in the CRU reactor system from the recovery system.

   e. Stop all injections and block in.

2. Assist in line-up of oil circulation through the debuatnizer charge coil section.

EMERGENCY PROCEDURES

TEXACO INC.

PLANT: PUGET SOUND DATE: DECEMBER 1971
DEPARTMENT: CRU & HTU
OPERATION: 6D-F1 HEATER TUBE RUPTURE IN REACTOR SYSTEM SECTION

Operator Helper A: (Cont.)

3. Assist in depressuring and purging the CRU reactor system. (Block in 6D-K1 compressor.)

4. When time permits, route all product streams to slop tanks.

5. Assist in blocking in the HTU reactor system to save H^2 gas for circulation.

6. Shutdown recovery pumps on the HTU when they are no longer needed.

7. Shut off the stripping steam to the rerun tower stripper.

8. Assist in relighting the fires in 7C-F1 charge heater for circulation when time permits.

9. Blind off fuel gas to 7C-F2 and 7C-F3 heaters and shut off the safety steam to these heaters, when time permits.

10. Purge out 6D-K1 compressor with Nitrogen, if available.

NOTE: The above items are a general outline and are to be discussed with Operator A on what he wants done in case of an emergency situation.

EMERGENCY PROCEDURES

TEXACO INC.

PLANT: PUGET SOUND DATE: DECEMBER 1971
DEPARTMENT: CRU & HTU
OPERATION: SPLIT TUBE IN 7C-F1 HEATER

Operator A:

1. It is the responsibility of Operator A to know the duties of each member of his crew and direct and co-ordinate the procedure that you have decided to follow.

2. If the fire is contained to 7C-F1 heater area, keep the CRU in operation.

3. Notify Operator B and Helper what procedure you have decided to follow.

4. Stop charge to HTU reactor system.

   a. Cut fires out of 7C-F1, F2 and F3 heaters and start safety steam.

   b. Shut down 7C-K1 compressor.

   c. Isolate reactor systems and switch pressure control to Product Separator.

   d. Close block valves for 6PIC-28 VB-1 and VB-2 control valves to fuel gas system from H. P. Separator.

   e. Depressure HTU reactor system to flare off the H. P. Separator.

   f. Line up cold charge to CRU and block off hot HSR Naphtha from HTU.

5. Keep 7C-K2 compressor in operation if possible, while depressuring HTU reactor system to flare, then shut down 7C-K2.

6. Stop all injection pumps and block in.

7. When pressure is down to 50# PSI or less on the H. P. Separator, pump out liquid to emergency cooling box. Be sure the H. P. Separator is blocked off from the L. P. Separator.

   a. Block in 7C-K1 compressor.

EMERGENCY PROCEDURES

TEXACO INC.

PLANT: PUGET SOUND DATE: DECEMBER 1971
DEPARTMENT: CRU & HTU
OPERATION: SPLIT TUBE IN 7C-F1 HEATER

Operator A: (Cont.)

8. When pressure on the HTU reactor system is down to about 5# PSI, route Nitrogen into discharge line of 7C-K1 compressor and sweep out reactor system slowly to control fire.

   a. Have the Fire Company keep water on structures and pipe work in general area.

   b. Shut down recovery pumps when not needed.

   c. Have steam connected to HTU reactor system.

   d. When steam is available, start steaming out the HTU reactor system slowly to keep fire under control and shut off Nitrogen.

   e. When time permits, slop product streams on HTU side.

   f. When time permits, blind off fuel gas to the HTU heater.

      (1) Keep safety steam in heaters until given approval to shut off.

9. Keep Hydrocarbons pumped off on the H. P. Separator while steaming reactor system. Do not let any air into the reactor system.

10. Keep steaming the HTU reactor system until ordered otherwise.

Operator B:

1. When directed, notify all departments that will be effected.

2. Cut all fires back to a minimum on 7C-F1, F2, and F3 heaters.

3. Cut the HTU charge to half design rate.

EMERGENCY PROCEDURES

TEXACO INC.

PLANT: PUGET SOUND DATE: DECEMBER 1971
DEPARTMENT: CRU & HTU
OPERATION: SPLIT TUBE IN 7C-F1 HEATER

Operator B: (Cont.)

3. (Cont.)

   a. When the HTU charge pump is shut down, close control valve 7FRC-6.

   b. Cut RPM to a minimum on 7C-K1 compressor.

   c. Close control valve 7LIC-4 to prevent back-flow from the L. P. Separator.

   d. Route Fractionator gas to FCCU when 7C-K2 compressor is shut down.

   NOTE: If the HTU reactor system is depressured, it is alright to route to the flare system.

   e. Hold levels in the HTU recovery system.

Operator Helper A:

Do not cut fires in heaters with spiral tubes

1. Cut fires out of 7C-F1, F2, and F3 heaters and cut in safety steam. Operator A can shut down the charge pump.

2. Assist in the shutdown of 7C-K1 compressor and isolating the reactor systems.

   a. Assist in the switch of pressure control to the Product Separator and blocking off of the fuel gas control valves on the H. P. Separator.

   b. Block in 7C-K1 compressor.

3. Assist in the line up of cold HSR Naphtha charge to the CRU and blocking off hot HSR Naphtha to the CRU from the HTU.

4. Assist in the isolating of the HTU reactor system.

5. Shut down Recovery pumps when no longer needed and blocking in of the recovery system.

EMERGENCY PROCEDURES

TEXACO INC.

PLANT: PUGET SOUND DATE: DECEMBER 1971
DEPARTMENT: CRU & HTU
OPERATION: SPLIT TUBE IN 7C-F1 HEATER

Operator Helper A: (Cont.)

6. Assist in depressuring the HTU reactor system and purging out.

   a. Assist in steaming out the HTU reactor system and pumping out the H. P. Separator.

   b. Slop all product streams on the HTU side.

   c. Shut down and block in all injection pumps.

   d. Assist in the shutdown of 7C-K2 compressor.

7. Blind off the fuel gas to heaters on the HTU.

   a. Leave safety steam in heaters until ordered to be taken out.

5.0

EMERGENCY PROCEDURES

TEXACO INC.

PLANT: PUGET SOUND DATE: DECEMBER 1971
DEPARTMENT: CRU & HTU
OPERATION: TUBE FAILURE IN 7C-F2 HEATER

Operator A:

1. It is Operator A's responsibility to know the duties of each member of his crew and direct and co-ordinate the procedure that you have decided to follow.

2. HTU must be shut down.

3. If the tube leak is small and the temperature can be controlled in 7C-F2 heater, unit can be shut down at a more controlled condition.

4. If the tube rupture is large, it will be necessary to bring the unit down as quickly as possible.

5. Notify Operator B and Helper what procedure is to be taken.

6. Reduce fires in 7C-F1 heater to hold 600°F outlet temperature and stop charge to HTU reactor system.

   a. Line up cold HSR Naphth to CRU charge drum and close off the hot HSR Naphtha.

7. Cut fires out of 7C-F2 and 7C-F3 heaters if possible.

   a. If fires can be cut out of 7C-F3 heater, cut in safety steam.

   b. If possible, cut in a small amount of safety steam to 7C-F2 heater fire box.

   c. Have the Fire Company keep water on 7C-F2 heater structure and equipment in general area.

8. Block off liquid out of LP Separator to Fractionator feed line.

   a. Close off main block valve on 7C-F2 heater outlet line near heater, if possible, and open line to emergency cooling box. If too much fire, go to Step b.

   b. Close Fractionator tower feed line, block valve at tower.

EMERGENCY PROCEDURES

TEXACO INC.

PLANT: PUGET SOUND DATE: DECEMBER 1971
DEPARTMENT: CRU & HTU
OPERATION: TUBE FAILURE IN 7C-F2 HEATER

Operator A: (Cont.)

8. (Cont.)

   c. Line up blowdown pump 6D-GM-13 to pump out 7C-E4&5 and 7C-E6&7 exchangers, if possible, to emergency cooling box.

   d. Line up 7C-G4A pump to take suction on LP Separator and route to slop tank to hold level.

   e. When fire has decreased in 7C-F2 heater, line up heater outlet line to emergency cooling box and close main block valve outlet line near heater. USE CAUTION!

   f. Cut in steam to 7C-E4&5 and 7C-E6&7 exchanger (Shell side) to steam out oil in 7C-F2 heater tubes to emergency cooling box, SLOWLY.

9. Shut down recovery pumps on HTU when not needed.

   a. Shutdown 7C-K2 compressor when not needed.

   b. Shut off all injection pumps and block in.

   c. Block in liquid level in HP Separator.

   d. Stop all product streams on HTU side.

10. When fire is out in 7C-F2 heater, blind off fuel gas to 7C-F2 and 7C-F3.

   a. Shut off safety steam to 7C-F3 heater.

   b. Continue to steam 7C-F2 heater tubes to emergency cooling box. Also keep safety steam in fire box until approval has been given to shut steam off.

11. When 1½ hours of hydrogen gas circulation has been completed and HTU reactor outlet temperature is below 600°F, shut off fires to 7C-F1 heater; all but one burner, leave a pilot fire burning.

   a. Shut down 7C-K1 compressor.

   NOTE: Always keep a safe distance from heater (7C-F2) when trying to clean heater of oil (even when fire has been put out while steaming.)

EMERGENCY PROCEDURES

TEXACO INC.

PLANT: PUGET SOUND DATE: DECEMBER 1971
DEPARTMENT: CRU & HTU
OPERATION: TUBE FAILURE IN 7C-F2 HEATER

Operator B:

1. When directed by Operator A, notify all departments that will be effected. (You can have someone in the control room do this job.) Also make the fire call.

2. Cut fires to a minimum in 7C-F3 and 7C-F2 heaters.

   a. Reduce fires in 7C-F3 heater to hold 600°F outlet temperature.

   b. Reduce HTU reactor charge to half design rate.

   c. When HTU charge pump has been shut down, close 7FRC-6 control valve.

3. Reduce RPM on 7C-K1 compressor to 7,000.

4. Shutdown SR Naphtha charge booster pump if coming directly from Tank 17 or 11 to HTU. Leave it running, if used for VPS unit outside reflux.

5. Close off 7FRC-14 control valve when 7C-G4A pump is lined up to pump Separator off.

6. Close reboiler control valves on HTU reactor system.

7. When 7C-K2 compressor is shut down, route Fractionator tower gas to flare.

   a. Lower Fractionator tower pressure to help decrease fire in 7C-F2 heater. You may need to have vacuum breaker reset at lower pressure.

8. Hold levels in recovery system.

9. Maintain positive pressure on tower accumulator and drums to prevent pulling a vacuum.

10. When HTU reactor hydrogen has been circulating 1½ hours at 600°F and HTU reactor outlet temperature is below 600°F, notify Operator A.

EMERGENCY PROCEDURES

TEXACO INC.

PLANT: PUGET SOUND DATE: DECEMBER 1971
DEPARTMENT: CRU & HTU
OPERATION: TUBE FAILURE IN 7C-F2 HEATER

Operator Helper A:

1. Reduce fires in 7C-F1 heater so Operator B can hold 600°F on heater outlet.

2. Operator A can shutdown HTU charge pump.

   a. Block in 6FRC-6 control valve when time permits.

3. Cut fires out of 7C-F2 and 7C-F3 heaters if possible, and start safety steam at a controlled amount.

4. Assist in line-up of cold HSR Naphtha charge to CRU charge drum and shut off hot HSR Naphtha.

5. Assist in blocking off the liquid out of the L. P. Separator and closing off the Fractionator feed line.

   a. Line up and start pumping L. P. Separator to hold level down to slop tank by using 7C-G4A pump.

   b. Assist in line up to pump off Fractionator feed exchangers to emergency cooling box.

   c. Assist in lining up emergency slop line off 7C-F2 heater outlet line to emergency cooling box.

   d. Assist in steaming out Fractionator tower feed line.

6. Assist in shutting down 7C-K2 compressor and HTU recovery pumps when no longer needed, also the injection pumps.

7. Stop all product stream on HTU when time permits.

8. Assist in shuting down 7C-F1 heater and 7C-K1 compressor.

9. Assist in isolating reactor system to hold hydrogen pressure.

NOTE: The above items are a general outline and are to be discussed with Operator A as to what he would want done in case of an emergency situation.

EMERGENCY PROCEDURES

TEXACO INC.

PLANT: PUGET SOUND DATE: DECEMBER 1971
DEPARTMENT: CRU & HTU
OPERATION: 7C-F3 HEATER TUBE FAILURE

Operator A:

1. It is the responsibility of Operator A to know the duties of each member of his crew and direct and co-ordinate the procedure that has been decided to follow.

2. HTU must be shut down and keep the CRU in operation if possible.

3. If the tube leak is small and the temperature can be controlled in 7C-F3 heater, unit can be shut down under more controlled conditions.

4. If the tube rupture is large, it will be necessary to bring the unit down as quickly as possible.

5. Notify Operator B and Helper what procedures is to be taken.

6. Reduce fires in 7C-F1 heater to hold 600°F outlet temperature and stop charge to HTU reactor system.

7. Cut fires out of 7C-F2 and 7C-F3 heater and cut in safety steam, at a controlled amount, if possible, in 7C-F3 heater.

   a. Cut in safety steam to 7C-F2 heater, is possible.

8. Shut down Fractionator reboiler pump.

   a. Have 7FRC-60 control valve closed.

   b. Close main block valve on 7C-F3 outlet line at Fractionator tower.

9. Line up cold HSR Naphtha charge to CRU charge drum and shut off hot HSR Naphtha charge from HTU.

10. When #8 has been completed, line up 7C-F3 heater outlet to emergency cooling box.

    a. Line up and start steaming 7C-F3 heater tubes to emergency cooling box.

    b. When time permits, close one block valve on 7FRC-60 control valve, if possible.

EMERGENCY PROCEDURES

TEXACO INC.

PLANT: PUGET SOUND DATE: DECEMBER 1971
DEPARTMENT: CRU & HTU
OPERATION: 7C-F3 HEATER TUBE FAILURE

Operator A: (Cont.)

11. Shut down all injection pumps and block in.

    a. Stop all product stream on HTU side.

    b. Shut down all recovery pumps on HTU when not needed.

    c. Blind off fuel gas to 7C-F3 and 7C-F2 heaters when time permits.

    d. Shut down 7C-K2 compressor when no longer needed.

12. Continue H_2 (hydrogen) circulation on HTU reactor system for at least 1½ hours at 600°F, 7C-F1 heater outlet temperature, or until Foreman has given other instructions.

13. Block in liquid off HP Separator and LP Separator drums.

14. Keep steaming 7C-F3 heater tubes to emergency cooling box until unit Foreman has given approval to stop.

    a. Keep fire hoses on 7C-F3 structure.

    b. Keep water flushing any oil away from 7C-F3 heater to seives. sewers

15. When fire has been put out, keep safety steam in 7C-F3 until cooled down.

    NOTE: Always keep a safe distance from heater (7C-F3) when trying to clear heater of oil (even when fire has been put out while steaming).

Operator B:

1. When directed by Operator A, notify all departments that will be affected. (Have someone in the control room do this job. Also make fire call.)

EMERGENCY PROCEDURES

TEXACO INC.

PLANT: PUGET SOUND DATE: DECEMBER 1971
DEPARTMENT: CRU & HTU
OPERATION: 7C-F3 HEATER TUBE FAILURE

Operator B: (Cont.)

2. Cut fires to a minimum in 7C-F3 and 7C-F2 heater.

   a. Reduce fires in 7C-F1 heater to hold 600°F outlet.

   b. Reduce HTU reactor charge to half design rate.

   c. When HTU charge pump has been shut down, close 7FRC-6 control valve.

3. Reduce RPM on 7C-K1 compressor to lowest governor control speed.

4. Shut down SR Naphtha charge booster pump if coming directly from Tanks 17 or 11 to VPS unit outside reflux.

5. When 7C-K2 compressor is shut down, route Fractionator tower gas to flare system.

   a. Bring Fractionator tower pressure down to two or three pounds pressure. Have Operator lower setting on vacuum breaker.

   b. Close 7FRC-60 control valve when Fractionator reboiler pump is shut down.

6. Adjust or close reboiler controls on Fractionator tower strippers to prevent overheating reboilers.

7. When HTU reactor hydrogen has been circulating for 1½ hours and reactor outlet is below 600°F, notify Operator A so he can cut fires and shut down 7C-K1 compressor. He will leave a pilot burning in 7C-F1 heater.

8. Maintain positive pressure on towers, accumulator, and drums to prevent pulling a vacuum.

EMERGENCY PROCEDURES

TEXACO INC.

PLANT: PUGET SOUND DATE: DECEMBER 1971
DEPARTMENT: CRU & HTU
OPERATION: 7C-F3 HEATER TUBE FAILURE

Helper A:

1. Reduce fires in 7C-F1 heater so Operator B can hold 600 F on heater outlet temperature.
2. Operator A can shut down HTU reactor charge pump.
3. Cut fires out of 7C-F2 and 7C-F3 if possible.
   a. Cut in safety steam at a controlled amount in 7C-F3 heater.
   b. Cut in safety steam in 7C-F2 heater.
4. Shut down Fractionator reboiler pump.
   a. Assist in closing main block on 7C-F3 outlet line at Fractionator tower.
5. Assist in line up of cold HSR Naphtha charge to CRU charge drum and shut off hot HSR from HTU.
6. When #4 has been completed, assist in line up of 7C-F3 heater outlet to emergency cooling box (when possible).
   a. Line up and start steaming 7C-F3 heater tubes to emergency cooling box.
   b. When able, close one block valve on 7FRC-60 control valve.
7. Shut down all injection pumps and block in.
   a. Stop all product streams on HTU side.
   b. Assist in shutting down all recovery pumps on HTU when not needed.
   c. Blind off fuel gas to 7C-F3 and 7C-F2 heaters, when time permits.
   d. Assist in shutting down 7C-K2 compressor when no longer needed.
8. Cut fires out of 7C-F1 heater when instructed to and leave one pilot burning.

EMERGENCY PROCEDURES

TEXACO INC.

PLANT: PUGET SOUND DATE: DECEMBER 1971
DEPARTMENT: CRU & HTU
OPERATION: 7C-F3 HEATER TUBE FAILURE

Helper A: (Cont.)

9. Assist in the shutdown of 7C-K1 compressor.

10. Block in liquid off the HP Separator and the LP Separator drums.

NOTE: The above steps are not a hard set of rules. It is best to talk it out with Operator A so both can work as a team.

EMERGENCY PROCEDURES

TEXACO INC.

PLANT: PUGET SOUND DATE: DECEMBER 1971
DEPARTMENT: CRU & HTU
OPERATION: STEAM FAILURE

Operator A:

1. It is the responsibility of Operator A to know the duties of each member of his crew and direct and co-ordinate the proceudres that you have decided to follows.

2. In a steam failure, Platformer and Hydrotreater must be shut down as quickly and as safely as possible. Recycle Gas Compressors must be run as long as possible to clear reactor systems of charge, if possible.

3. Shut off fires in all heaters and stop charge to both units.

   a. Line up safety steam to heaters for cooling effect and blind fuel gas.

4. Start electric drive lube and seal oil pumps and shut down steam drive pumps for 7C-K1 and 6D-K1 compressors.

5. Isolate reactor systems and recovery system from reactor systems.

6. Maintain oil circulation through Debutanizer Charge Coil section of 6D-F1 heater as long as needed.

7. If Reactor systems had enough time to be cleared of charge (5 to 10 minutes recycle gas circulation), leave systems set under hydrogen pressure.

   a. If there was not enough time to clear out the reactor systems of charge, depressure systems by venting off to flare from Product Separator and H. P. Separator until 200# PSI is reached on both systems.

   b. If steam failure will be for a long duration, it will be necessary to depressure and purge out reactor systems with nitrogen.

   c. When Recycle Gas Compressors are shut down, be sure to block in compressors and close off vents on sour seal oil traps and ranarex sample lines.

EMERGENCY PROCEDURES

TEXACO INC.

PLANT: PUGET SOUND
DEPARTMENT: CRU & HTU
OPERATION: STEAM FAILURE

DATE: DECEMBER 1971

Operator A: (Cont.)

8. Shut down recovery system pumps when no longer needed. Be sure steam drive pumps are shut off at throttle, also, 6D-K1 and 7C-K1 turbine throttle valves.

9. Make sure all injection pumps are shut down and blocked off.

   a. Shut off stripping steam to Rerun tower stripper to prevent any leakage of hydrocarbon back into the steam line at low pressure.

10. Shut down 7C-K2 compressor and route Fractionator gas to flare.

11. Hold levels in recovery systems.

    a. Close

12. Slop all product streams.

Operator B:

1. Notify departments effected when shutting down. Cut fires to a minimum in all heaters.

   a. Cut charge to one-half design rate on the CRU and the HTU.

   b. When charge is stopped to the CRU and the HTU, close charge control valves.

   c. Lower RPM and 6D-K1 and 7C-K1 compressors to conserve steam.

   d. Close reboiler control valves to prevent over-heating.

   e. Hold levels in recovery systems.

   f. Stop SR Naphtha charge booster pumps if lined up to the HTU.

EMERGENCY PROCEDURES

TEXACO INC.

PLANT: PUGET SOUND
DEPARTMENT: CRU & HTU
OPERATION: STEAM FAILURE

DATE: DECEMBER 1971

Operator B: (Cont.)

2. When 7C-K2 compressor is shut down, route Fractionator tower gas to flare system only.

3. Be sure to maintain positive pressure on all towers, accumulators and drums to prevent pulling vacuum.

4. Check CRU reactors' skin temperatures for possible hot spots. If any hot spots develop, notify Operator A so he can dump reactor system and purge out with nitrogen.

Operator Helper A:

1. Shut off fires to all heaters when directed. (Fuel oil and fuel gas.)

   a. Shut down charge pumps.

   b. Assist in block in of reactor systems.

   c. Assist in isolating reactor systems from each other.

   d. Shut off all injection pumps and block in.

   e. Shut off stripping steam to Rerun Tower Stripper.

   f. Assist in shutting down recovery pumps when no longer needed.

2. Assist in the shutdown of 7C-K2 compressor.

3. Assist in the shutdown of 6D-K1 and 7C-K1 compressors and block in.

4. Slop all product streams when time permits.

5. Be sure electric auxilliary pumps for 6D-K1 and 7C-K1 compressors are running to hold lube and seal oil pressures.

EMERGENCY PROCEDURES

TEXACO INC.

PLANT: PUGET SOUND
DEPARTMENT: CRU & HTU
OPERATION: STEAM FAILURE

DATE: DECEMBER 1971

Operator Helper A: (Cont.)

5. (Cont.)

NOTE: Above steps are not a hard set of rules. It is best to talk it over with Operator A so both can work as a team in an emergency condition.

EMERGENCY PROCEDURES

TEXACO INC.

PLANT: PUGET SOUND DATE: DECEMBER 1971
DEPARTMENT: CRU & HTU
OPERATION: COMPLETE COOLING WATER FAILURE

Operator A:

1. It is the responsibility of Operator A to know the duties of each member of his crew and direct and co-ordinate the procedure that you have decided to follow.

2. If the cooling water failure is expected and you have time, bring both units down as normally as possible.

3. If cooling water failure is evident and with very little time left, both units must be shut down as quickly and as safely as possible.

   a. On a partial cooling water failure, it may be only necessary to reduce the charge rates and lower the compressors' RPM's to keep temperatures in operating range.

4. Notify Operator B and Helper what you have decided to do.

5. Cut out all fires in heaters and stop charge to the units.

   a. Cut in safety steam to heaters.

6. Run recycle gas compressor's as long as possible to clear charge out or reactor systems and shutdown compressors. Watch temperatures on bearings; if any reach 178°F, shutdown compressors at this time! (Do not wipe out bearings; any temperature above 178°F will do this.)

7. Isolate reactor systems.

   a. Isolate recovery systems from reactor systems.

8. Shut down recovery pumps. Run pumps only if bearings temperatures are alright.

   a. Shut down all injection pumps and block in.

   b. Shut off stripping steam to rerun tower stripper.

EMERGENCY PROCEDURES

TEXACO INC.

PLANT: PUGET SOUND DATE: DECEMBER 1971
DEPARTMENT: CRU & HTU
OPERATION: COMPLETE COOLING WATER FAILURE

Operator A: (Cont.)

9. Block off hot HSR Naphtha from the HTU to the CRU charge drum.

10. Route all product streams to slop tank.

11. Hold levels in towers, strippers, accumulators, and drums.

12. Blind off fuel gas to heaters.

    a. Keep safety steam in heaters until cooled down.

13. Watch pressures on recovery systems, you may have to vent to flare system to prevent popping relief valve, when possible.

14. If reactor systems had enough time to be cleared of charge by hydrogen circulation (5 to 10 minutes circulation time), leave reactor systems blocked in.

    a. If not enough time to clear reactor systems of charge, it will be necessary to depressure reactor systems to flare and purge out with nitrogen.

Operator B:

1. When directed by Operator A, notify all departments that will be effected by the shutdown.

2. Reduce temperatures in all heaters and shutoff fuel oil burning.

3. Cut back charge rates to half design rate on both units.

    a. When charge is cut out of units, close control valves.

    b. Lower RPM speed to 7000 on both recycle gas compressors.

EMERGENCY PROCEDURES

TEXACO INC.

PLANT: PUGET SOUND DATE: DECEMBER 1971
DEPARTMENT: CRU & HTU
OPERATION: COMPLETE COOLING WATER FAILURE

Operator B: (Cont.)

4. Close off all reboiler control valves.

5. Hold levels in recovery systems.

6. Stop SR Naphtha charge booster pump if lined up to HTU.

7. When 7C-K2 compressor is shut down, route Fractionator O. H. Gas to flare system only.

8. Watch pressures on recovery systems closely. You may need to have the vent open to flare on some vessels, when possible, to prevent popping relief valves.

9. Check CRU reactors skin temperatures periodically for hot spots. If any are found, report them to the Operator A.

Operator Helper A:

1. Shut off fires to all heaters, when directed, to (fuel gas and fuel oil) and cut in safety steam.

   a. Assist in shutting down charge pumps.

   b. Assist in blocking in reactor systems.

   c. Keep close check on bearing temperatures on 7C-K1 and 6D-K1 compressors. Shut down compressors if temperature on bearings reach 178°F on any one bearing!

   d. Assist in blocking in recovery systems.

   e. Shut down recovery pumps.

   f. Shut off all injection pumps and block in.

2. Assist in shutting down reycyle gas compressors.

EMERGENCY PROCEDURES

TEXACO INC.

PLANT: PUGET SOUND DATE: DECEMBER 1971
DEPARTMENT: CRU & HTU
OPERATION: COMPLETE COOLING WATER FAILURE

Operator Helper A: (Cont.)

3. Assist in shutdown of 7C-K2 compressor.
4. Shut off stripping steam to Rerun tower strippers.
5. Slop all product streams.
6. Blind off all fuel gas to heaters.
7. Block in hot HSR Naphtha from the HTU to the CRU charge drum.

EMERGENCY PROCEDURES

TEXACO INC.

PLANT: PUGET SOUND DATE: DECEMBER 1971
DEPARTMENT: CRU & HTU
OPERATION: 6D-K1 RECYCLE GAS COMPRESSOR FAILURE

Operator A:

1. If 6D-K1 compressor failed in operation, it will be necessary to shut down both units as quickly and as safely as possible.

2. When 6D-K1 compressor fails due to mechanical failure (bearings and seals) or pipe work breaks, and when more damage may be caused by restarting and create an unsafe condition, Operator A will have to make the final decision as to what procedure to follow.

3. Stop charge to CRU and HTU and cut out fires to 6D-F1 heater and cut in safety steam.

4. Cut back fires in 7C-F1 heater to hold 600°F outlet temperature and maintain hydrogen circulation on HTU reactor system.

   a. Cut fires out of 7C-F2 and 7C-F3 heater and cut in safety steam.

5. If 6D-K1 compressor was shut down due to hydrogen leakage, it would be best to block in compressor immediately when possible. Then purge out with nitrogen, when time permits.

6. Isolate CRU and HTU reactor systems from each other and from recovery systems.

   a. Stop all injections and block in.

   b. Stop 6D-GM-23 pump.

   c. Route all product streams to slop tank.

   d. Shut off hot HSR Naphtha to CRU.

   e. Shut down 7C-K2 compressor when not needed.

   f. Hold levels in recovery systems and shut down pumps in recovery system when no longer needed.

   g. Shut off stripping steam to rerun tower stripper.

   h. Blind off fuel gas to 7C-F2, 7C-F3 and 6D-F1 heaters and shut off safety steam.

EMERGENCY PROCEDURES

TEXACO INC.

PLANT: PUGET SOUND DATE: DECEMBER 1971
DEPARTMENT: CRU & HTU
OPERATION: 6D-K1 RECYCLE GAS COMPRESSOR FAILURE

Operator A: (Cont.)

7. If 6D-K1 compressor can not be restarted to run at low RPM to sweep out CRU reactor system, the reactor system must then be depressured and purged out with nitrogen to clear reactor system of charge.

8. If repairs are to be made to 6D-K1 compressor element, it will be necessary to wash compressor first, when time permits before repairs are made.

9. When 1½ hours of hydrogen circulation at 600°F are finished on HTU reactor, fires can be cut back to one small pilot and 7C-K1 compressor shut down. Leave HTU reactor system under hydrogen pressure.

Operator B:

1. When directed by Operator A, notify all departments that will be affected on shutdown.

2. Cut fires to a minimum in 6D-F1 heater.

   a. Cut charge on both units to half design rate and lower 7C-F1 heater outlet temperature to 600°F.

   b. Cut fires to a minimum on 7C-F2 and 7C-F3 heaters.

   c. When charge is cut out of both reactor systems, close charge control valves.

   d. Lower speed on 7C-K1 compressor to 7000 RPM.

3. When 7C-K2 compressor is shut down, route Fractionator Tower gas to flare system.

4. Close or adjust reboiler controls on strippers.

5. Hold levels in recovery systems.

6. Shut down SR Naphtha booster pump if lined up to HTU only.

EMERGENCY PROCEDURES

TEXACO INC.

PLANT: PUGET SOUND DATE: DECEMBER 1971
DEPARTMENT: CRU & HTU
OPERATION: 6D-K1 RECYCLE GAS COMPRESSOR FAILURE

Operator B: (Cont.)

7. Keep positive pressure on all recovery system vessels to prevent pulling a vacuum.
8. Check CRU reactor skin temperatures for hot spots, periodically.
9. When HTU reactor system has been cleared of charge (1½ hours of hydrogen gas circulation at 600°F), notify Operator A.

Operator Helper A:

1. Cut fires out of 6D-F1 heater and start safety steam to same.
2. Assist in getting charge cut out of reactor systems.
3. Cut fires back in 7C-F1 heater to hold 600°F outlet temperature.
4. Cut fires out of 7C-F2 and 7C-F3 heaters and cut in safety steam.
5. Assist in blocking in 6D-K1 compressor and isolating reactor systems.
6. Shut off all injection pumps and block in.
7. Assist in blocking in recovery systems (shut down pumps when no longer needed) to hold levels.
8. Route all product streams to slop tank.
9. Shut off stripping steam to rerun tower stripper.
10. Blind off fuel gas to 6D-F1, 7C-F2 and 7C-F3 heaters. Then shut off safety steam to them.
11. Assist in depressuring and purging out CRU reactor system of charge.
12. Assist in taking fires out of 7C-F1 heater and shutdown of 7C-K1 compressor when HTU reactor system is ready.

EMERGENCY PROCEDURES

TEXACO INC.

PLANT: PUGET SOUND DATE: DECEMBER 1971
DEPARTMENT: CRU & HTU
OPERATION: 7C-K1 RECYCLE GAS COMPRESSOR FAILURE

Operator A:

1. If 7C-K1 compressor fails in operation, it will be necessary to shut down HTU as quickly and as safely possible. Keep CRU in operation when possible.

2. When 7C-K1 compressor fails due to mechanical failure (bearings and seals) or pipe work breaks, and when more damage may be caused by restarting and create an unsafe condition, the Operator A will have to make the final decision on what procedure to follow.

3. Stop charge to HTU anc cut out fires in 7C-F1, 7C-F2 and 7C-F3 heaters. Start safety steam to these heaters.

4. If 7C-K1 compressor was shut down due to hydrogen leakage, it would be best to block in compressor immediately when possible. Then purge out with nitrogen when time permits.

5. Route CRU excess hydrogen gas off Product Separator to discharge line of 7C-K1 compressor to sweep charge out of HTU reactor system.

6. Line up cold HSR Naphtha charge to CRU charge drum and block off hot HSR Naphtha from HTU.

7. Stop all injections on HTU and shut off water injection to CRU reactor system.

8. Route all product streams to slop tank on HTU side.

9. Shut down 7C-K2 compressor when not needed and route gas to flare.

10. Isolate recovery system from HTU reactor system.

11. Shut down recovery pumps on HTU when no longer needed and hold levels in vessels.

12. Blind off fuel gas to 7C-F1, 7C-F2 and 7C-F3 heaters. Then shut off safety steam.

13. Keep hydrogen gas flow going through HTU reactor system from CRU until approval is given To Shut.

14. If repairs are to be made to 7C-K1 compressor element, it will be necessary to wash compressor first, when time permits, before repairs are made.

EMERGENCY PROCEDURES

TEXACO INC.

PLANT: PUGET SOUND DATE: DECEMBER 1971
DEPARTMENT: CRU & HTU
OPERATION: 7C-K1 RECYCLE GAS COMPRESSOR FAILURE

Operator B:

1. When directed by Operator A, notify all departments that will be affected on shutdown of HTU.
2. Cut fires to a minimum in 7C-F1, 7C-F2 and 7C-F3 heaters.
   a. Cut HTU reactor charge to ½ design rate.
   b. When charge is cut out of HTU, close control valve off (7FRC-6).
   c. When 7C-K2 compressor is shut down, route Fractionator Tower gas to flare system.
   d. Hold levels in recovery system on HTU.
3. Maintain CRU operations.
4. Shut down SR Naphtha booster pump if lined up to HTU.
5. Keep positive pressure on all recovery system vessels to prevent pulling a vacuum.
6. Watch HP Separator level and draw-off when needed while sweeping HTU reactor system out with hydrogen gas from CRU.

Operator Helper A:

1. Cut fires out of 7C-F1, 7C-F2 and 7C-F3 heaters. Operator A can shut down HTU charge pump.
2. Cut in safety steam to above heaters when gas is shut off.
3. Assist in blocking in 7C-K1 compressor.
4. Assist in line-up of cold HSR Naphtha to CRU and block off hot HSR Naphtha from HTU to CRU.

EMERGENCY PROCEDURES

TEXACO INC.

PLANT: PUGET SOUND DATE: DECEMBER 1971
DEPARTMENT: CRU & HTU
OPERATION: 7C-K1 RECYCLE GAS COMPRESSOR FAILURE

Operator Helper A: (Cont.)

5. Assist in line-up of hydrogen gas from Product Separator to discharge line of 7C-K1 compressor.

6. Stop all injection on HTU and block in.

   a. Stop water injection to CRU reactor system.

   b. Route all product streams to slop tank on HTU.

   c. Assist in isolating HTU reactor system from recovery system.

   d. Assist in shutdown of 7C-K2 compressor when not needed and route gas from Fractionator Tower to flare off 7PIC-125 control valve.

   e. Assist in shutdown of recovery pumps on HTU.

   f. Blind off fuel gas to 7C-F1, 7C-F2, and 7C-F3 heaters. When done, shut off safety steam to these heaters.

   g. Assist in depressuring 7C-K1 compressor and purging out with nitrogen.

EMERGENCY PROCEDURES

TEXACO INC.

PLANT: PUGET SOUND DATE: DECEMBER 1971
DEPARTMENT: CRU & HTU
OPERATION: COMPLETE INSTRUMENT AIR FAILURE

Operator A:

1. When instrument air to units fail, it will be necessary to shut down both units as quickly and as safely as possible.

2. Be sure it is an instrument air failure, and if so, find out the cause immediately if possible. Someone might have closed off the instrument air block valve at the battery limits by mistake or might have a partial air failure due to freeze-up on one section of the unit that can be operated by manual control until corrected.

3. In an instrument air failure, units are in a very serious condition. It is very important to be familiar with the action of all control valves. Memorize critical control valve actions on instrument air failure. Remember, all air to open control valves will close and all control valves that air closes will go wide open.

   a. In control room on total instrument air failure, the only indications will be console temperatures and L&N recorders. We will have phone communications outside, and the air horn is on plant air.

   b. Close all control valves on controller on unit control board in control room, if there is no instrument air in control room.

   c. If Operator B is needed more, he can be requested to go outside after he has done his job on the board. He can help outside for a short period of time.

4. Shut down CRU and HTU charge pumps. Block off charge regulators later. They are closed on instrument air failure. Remember, charge pumps are running against closed control valves!

   a. Shut down 6D-GM-23 and 6D-G2 pumps.

5. Cut fires out of 6D-F1, 7C-F1, 7C-F2 and 7C-F3 heaters and cut in safety steam to these heaters. (Block in fuel oil on 6D-F1 heater if it is in service too.)

EMERGENCY PROCEDURES

TEXACO INC.

PLANT: PUGET SOUND DATE: DECEMBER 1971
DEPARTMENT: CRU & HTU
OPERATION: COMPLETE INSTRUMENT AIR FAILURE

All Operators: (Cont.)

6. Open by-passes around control valves on 6LIC-7 and 7LIC-4 to hold levels in Product Separator and H. P. Separator to prevent liquid from carrying-over to compressors. 7C-K1 and 6D-K1 compressors do not have any shutdown features other than overspeed trips if the compressor is running.

7. Control RPM's on Recycle Gas Compressors (6D-K1 and 7C-K1). Use throttle valves if necessary.

   a. Shut down 7C-K2 compressor.

   b. Open by-pass around 7PIC-125 control valve and route to flare.

   c. Control flow rate off H. P. Separator to hold level. Control valve will be wide open.

   d. Adjust seal oil differential pressures on 6D-K1 and 7C-K1 compressors. Control valves will be wide open. Pinch down on one side of control valves to do this to maintain about 6.5 to 5.0 differential seal oil pressure.

8. Shut down all recovery pumps as soon as possible.

9. Run 6D-K1 and 7C-K1 compressors long enough to clear reactors of charge when possible, (10 to 15 minutes after charge is cut out would be the minimum). Then shut them down if everything looks alright.

10. Isolate reactor systems from each other.

    a. Isolate recovery systems from reactor systems.

11. Keep close check on separator levels and block off when no longer gaining.

12. Shut off all injections and block in, ~~place~~.

13. Shut off stripping steam to rerun tower stripper.

EMERGENCY PROCEDURES

TEXACO INC.

PLANT: PUGET SOUND DATE: DECEMBER 1971
DEPARTMENT: CRU & HTU
OPERATION: COMPLETE INSTRUMENT AIR FAILURE

All Operators: (Cont.)

14. Stop all product streams.

15. Keep close check on all towers, vessels, drums and accumulators for pressure and levels. Keep in mind that there will not be any vacuum breakers to hold pressure to prevent a vacuum from being pulled on equipment as units cool down. By-passes must be used for this job.

16. Blind off all fuel gas to heaters and leave safety steam cut in for cooling.

Operator B:

1. It will be very important for the board man to find out the cause of the instrument air failure; broken line, freeze-up, compressor failure, etc. If it is the total plant or only the unit, the Operator will be able to decide what to do or if it is going to be out for a long period of time or a short period only.

2. If it is a total air failure for instruments and will be out for a long period of time:

   a. Close all instruments off on control board. If no air is going to instruments, switch to manual control.

   b. Check console and L&N recorders for temperature. If any temperature is indicating high, report it to the outside Operator for correction.

   c. If you can be of no help in the control room, check with Operator A as he might want to bring you out on the unit for a short period of time.

   d. Be sure to have the compressor speeds set at the lowest governor control speed.

11.3

EMERGENCY PROCEDURES

TEXACO INC.

PLANT: PUGET SOUND DATE: DECEMBER 1971
DEPARTMENT: CRU & HTU
OPERATION: COMPLETE INSTRUMENT AIR FAILURE

Operator Helper A:

1. When directed, shut down CRU charge pump and 6D-GM2 pump.

   a. Operator A can shut down HTU charge pump, pinch down on L. P. Separator liquid, and shut down 7C-K2 compressor.

2. The Helper may shut off fuel gas to 6D-F1 heater and block in fuel oil.

   a. Cut in safety steam to 6D-F1.

   b. Operator A can close fuel gas to 7C-F1, 7C-F2 and 7C-F3 heaters, cut in safety steam to them and shut down 6D-GM23 pump.

3. The Helper may open by-pass on 6LIC-7 control valve to control level in Product Separator.

   a. Operator A will open by-pass on 7LIC-4 to control level in H. P. Separator.

   NOTE: The above two steps are very important to do if 6D-K1 and 7C-K1 compressors are running, to prevent liquid from carrying over into compressors.

4. Check operations of compressors and, if need be, control speeds on throttle valves manually. (Operator A should check this.)

5. The Helper should open by-pass on 7PIC-125 control to flare system to control Fractionator Tower pressure.

6. Shut down all recovery pumps. (This job is for the man who is free at the time.)

7. Assist in isolating reactor systems from each other.

8. Assist in isolating recovery systems from reactor systems.

9. Assist in running Recycle Gas Compressor just long enough to clear reactor systems only. Then shut down.

10. Shut down all injection pumps and block in.

EMERGENCY PROCEDURES

TEXACO INC.

PLANT: PUGET SOUND DATE: DECEMBER 1971
DEPARTMENT: CRU & HTU
OPERATION: COMPLETE INSTRUMENT AIR FAILURE

Operator Helper A: (Cont.)

11. Shut off stripping steam to rerun tower stripper.

12. Stop all product streams.

13. Blind off fuel gas to heaters.

14. Leave safety steam in heaters.

15. Help keep positive pressure in all vessels to prevent pulling vacuum.

16. Assist in venting any excess pressure on towers, vessels, and drums that would cause relief valves to pop off to flare system.

17. Keep a close check on all equipment for possible leaks and fire.

18. Assist in getting units ready for re-start-up when instrument air has been resumed.

NOTE: Operator A should talk it over with his crew and try to have a definite plan worked out on what each should do before it happens!

EMERGENCY PROCEDURES

TEXACO INC.

PLANT: PUGET SOUND DATE: DECEMBER 1971
DEPARTMENT: CRU & HTU
OPERATION: TOTAL POWER FAILURE

Operator A:

1. If power failure is of short duration, it will be only necessary to restart electric driven pumps that were in service. Also, 7C-K2 compressor will need to be restarted if it was lost on power outage.

2. When a power failure occurs and it is not a momentary outage and pumps cannot be restarted shortly afterwards: It is best to shut down both units and recycle gas through reactor systems.

3. Operator A will have to make the final decision on what procedure to follow,

4. Shut down the CRU and HTU reactor charge pumps (the HTU charge pump should be down if on electric) and block in the charge control valves.

5. Reduce firing in 6D-F1 heater to hold 900°F reactor inlet temperatures.

   a. Reduce firing in 7C-F1 heater to hold 600°F reactor inlet temperature.

   b. Cut fires out of 7C-F2 and 7C-F3 heaters and cut in safety steam.

   c. Shut down 6D-GM-23 pump and block off hot HSR Naphtha from the HTU to the CRU charge drum.

   d. Isolate reactor systems from each other and block in reactor systems to hold hydrogen gas heat to a minimum. Block vents off on the sour seal traps on the recycle gas compressors. Do not forget to close sample lines off to Ranarex.

6. Shut off all injection pumps and block in.

7. Shut down all recovery pumps when not needed.

   a. Maintain oil circulation through the debutanizer charge coil of 6D-F1 heater while fires are in the heater. Will need to line up for this circulation.

EMERGENCY PROCEDURES

TEXACO INC.

PLANT: PUGET SOUND DATE: DECEMBER 1971
DEPARTMENT: CRU & HTU
OPERATION: TOTAL POWER FAILURE

Operator A: (Cont.)

7. (Cont.)

   b. Shut off steam to the rerun tower strippers.

   c. Slop all product streams to off-test tank.

8. Hold levels in recovery systems.

9. When power (electric) has been resumed, start-up units per Standing Instruction, if everything is alright.

Operator B:

When directed on what procedures to follow:

NOTE: All heater temperature controls should be put on manual control when power failure occurs.

1. Reduce temperatures on the CRU reactors' inlets to 900°F.

   a. Reduce temperature on the HTU reactor inlet to 600°F.

   b. Reduce charge rate to ½ design on the CRU.

   c. If on steam drive for the HTU charge pump, reduce charge rate to ½ design rate.

   d. When the charge is cut out of the CRU and the HTU reactor systems, close the charge control valves.

2. Lower the recycle gas compressors to 7000 RPM.

   a. Route Fractionator tower gas to the flare when 7C-K2 compressor is lost on outage.

3. Maintain oil circulation through debutanizer charge coil section of 6D-F1 heater.

EMERGENCY PROCEDURES

TEXACO INC.

PLANT: PUGET SOUND
DEPARTMENT: CRU & HTU
OPERATION: TOTAL POWER FAILURE

DATE: DECEMBER 1971

Operator B: (Cont.)

4. Close off the reboiler controls to prevent overheating reboilers.

5. Hold levels in recovery systems.

6. Keep a close check on the control board for any problems and inform the Operator outside of any developments that should be corrected.

7. Maintain positive pressure on all towers, vessels, accumulators, and drums. Do not let a vacuum be pulled from cooling down. Make sure vacuum breakers are doing their job!

Operator Helper A:

1. Cut back fires in 6D-F1 heater to hold 900°F reactor inlet temperatures.

   a. Reduce fires in 7C-F1 heater so operator can hold 600°F on reactor inlet temperature.

   b. Cut out fires in 7C-F2 and 7C-F3 heaters and start safety steam to these heaters.

   c. (Operator A) Shut down the CRU charge pump.

      If the HTU charge pump is running, the Operator Helper can shut it down.

   d. Shut down all injection pumps and block in.

   e. Shut down 6D-GM-23 pump.

   f. Assist in isolating reactor systems from each other and blocking in.

   g. Assist in line-up of oil circulation through the debutanizer charge coil in 6D-F1 heater.

2. Assist in the shutdown of recovery pumps when not needed!

EMERGENCY PROCEDURES

TEXACO INC.

PLANT: PUGET SOUND
DEPARTMENT: CRU & HTU
OPERATION: TOTAL POWER FAILURE

DATE: DECEMBER 1971

Operator Helper A: (Cont.)

3. Route all product streams to the slop tank.

4. Blind off fuel gas to 7C-F2 and 7C-F3 heaters, then shut off the safety steam.

5. Assist in blocking in the recovery systems to hold levels. Be sure the the Hot SR Naphtha is blocked off from the HTU to the CRU charge drum.

6. Keep a close check on the recycle gas compressors. (temperatures, oil pressures and for vibrations).

NOTE: The above steps are a general outline and should be discussed with Operator A as to what he wants done in an emergency situation, so each employe can work together as a team.