

III. OPERATING PROCEDURES (CONTINUED)

V. Incinerator

General Information

→ The incinerators remove VCM from the recovered monomer (RVCM)
receivers inert vent stream via combustion with air. The vinyl
chloride emission standard limits the maximum concentration of
vinyl chloride in atmospheric vents to 10 ppm. To reduce the VCM
level in the RVCM receiver inert vent stream, the inerts stream
is first cooled to 40°F by the chillers on top of the receivers to
condense the majority of the contained VCM. Inerts (and VCM) are *burned*
→ in a high efficiency burner at an operating temperature of ~~2,400~~²²⁰⁰°F.
→ Hydrogen chloride is a byproduct of combustion.

→ The liquid seal flame arrestor prevents burning VCM or natural gas
from flashing back through the inert vent line to the VCM re-
ceivers. The flame arrestor is a small vessel filled 1/3 to 1/2
full with an ethylene glycol solution. The inert vent line from
the recovered VCM receivers enters the flame arrestor just above
the liquid level. Internal baffles direct the flow of gases down-
ward, into the liquid. The inerts and VCM vapors pass ^{under} underneath
→ the baffle and ~~exit~~ out the top of the flame arrestor. A separate
→ line runs to each incinerator from the flame arrestor.

III. OPERATING PROCEDURES (CONTINUED)

V. Incinerator (Continued)

General Information (Continued)

The combustion gases from the incinerator are scrubbed with water in the quench tank and the packed scrubber. The incinerator's effluent gases are cooled and the hydrogen chloride is absorbed in the water, forming hydrochloric acid.

Both ^{of} the incinerators are not to be operated at the same time. Each incinerator has a double block and bleed valve assembly in the inerts feed line. These block valves will be closed whenever the incinerator is not in "high fire". This prevents flashback from one incinerator to the other. A manual block valve at the flame arrestor should be closed for the incinerator that is being used as the spare.

The major operating parameters of incinerator operations are as follows:

1. Both incinerators will operate continuously, either in the "high-fire" ^{or} ~~or~~ "low-fire" position or ^{the} ~~or~~ "pilot-on" position.
 - a. The "high-fire", or vent position is used when venting the inerts stream to the incinerator. This position provides maximum ~~combustion~~ air flow to the incinerator's combustion chamber to insure that sufficient air is available for combustion.

III. OPERATING PROCEDURES

V. Incinerator (Continued)

General Information (Continued)

- b. The "low-fire" position is used when venting is not required. This reduces combustion air flow to the incinerator so that natural gas flow can be minimized. This position keeps the flame stable and keeps the incinerator in a "ready" state.
- c. The "pilot-on" position may be used on the spare incinerator to conserve energy but to have the incinerator operating. Only the pilot ^{flame} light will be lit and will be fed a natural gas stream. The incinerator will have to be warmed up before use, which will take about 12 hours.

- 2. An increase in pressure on the old unit RVCM receivers indicates the need to vent inerts from the receivers. The panel operator will vent the inerts if the pressure is above the maximum pressure given on the receiver pressure indicator, or according to the Shift Supervisor's instructions.

- 3. The incinerator's combustion chamber will operate at approximately ²²⁰⁰2,400°F at all times and will be controlled by the dual ^{temperature} ~~temperature~~ controllers. When insufficient VCM is present to sustain the combustion chamber temperature, supplemental natural gas will be added.

III. OPERATING PROCEDURES (CONTINUED)

V. Incinerator (Continued)

General Information (Continued)

When excess VCM is present and the combustion chamber temperature is ^{above 2400°F} ~~high~~, steam will be added to decrease the temperature.

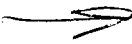
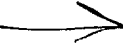
Sudden changes in temperature can damage the combustion chamber firebrick and refractory.

-
4. The hot combustion gases flow from the combustion chamber through a Hastelloy tube into the quench chamber. Water is sprayed on the outside of the Hastelloy tube, cooling^g both the tube and the combustion gases. This cooling is required to prevent "melting" of the quench chamber liner.
 5. Hydrogen chloride is removed from the combustion gases by the quench chamber and scrubber water spray. This produces a hydrochloric acid solution which overflows from the quench tank into the sewer. Hydrochloric acid can cause severe^e burns. In case of contact, wash the exposed area thoroughly with water and contact the Shift Supervisor immediately.

III. OPERATING PROCEDURES (CONTINUED)

V. Incinerator (Continued)

General Information (Continued)

- 
6. Special operating procedures must be followed during initial start-up of the incinerator to dry and cure the firebrick. The same procedure should be followed if the incinerator has been shutdown for an extended period of time and the combustion chamber temperature dropped^s to less than 1,000°F. Modified procedures can be used for short shutdowns.
7. The chief operator will check the incinerator at least twice per shift. Attention will be given to flow, pressure, and temperature indicators that are provided at the incinerator site.
- 
8. A constant amount of quench/scrubber water is supplied to the quench tank and the scrubber from the cooling water blowdown. City water will be used as the emergency source for the quench water in the event of a power outage or of low water flow.

III. OPERATING PROCEDURES (CONTINUED)

V. Incinerator (Continued)

Safety Procedures

Items which are of particular concern for working safely around the incineration system are as follows:

1. Hydrochloric Acid - One of the byproducts from the combustion of vinyl chloride is hydrogen chloride. The hydrogen chloride is absorbed in water forming hydrochloric acid. Hydrochloric acid and hydrogen chloride are poisonous and very corrosive. Contact with either one causes burns and ulceration of the skin. A safety shower and eyewash basin are provided at the incinerator site. The eyes or skin should be flushed immediately with water for five minutes or more following contact with hydrochloric acid. Any water in the incinerator area may contain hydrochloric acid.

When working around the quench chamber or scrubber where there is any possibility of coming in contact with the process streams, full face mask, protective rubber gloves (not cloth or leather) and clothing are required to avoid skin contact. The quench chamber and scrubber water should be drained to the sewer and then flushed with city water before opening ^{either} the unit for maintenance or inspection.

III. OPERATING PROCEDURES (CONTINUED)

V. Incinerator (Continued)

Safety Procedures (Continued)

2. Hot Metal Temperature - The shell of the combustion chamber is not ins^ulated. If it were insulated, high temperatures would be generated at the carbon steel surface which would affect the integrity of the metal. When the incinerator is operating, the outside surface temperature of the combustion chamber will exceed 300°F. Contact with the combustion chamber must be avoided unless protective clothing is worn.

3. Explosive Mixtures - When the fuel gas and combustion air control valves are adjusted for proper firing rates, an oxygen analyzer ^{is} ~~should be~~ used to determine the quantity of oxygen in the stack gases. Excess oxygen should always be present in the stack gases to avoid forming explosive gas mixtures. ^{and to prevent smoking in} ~~The~~ the incinerator. ^{The} amount of oxygen in the stack gases should range from three to seven percent on a dry gas basis under all firing conditions. The unit should never be run during oxygen deficient conditions (that is, when no oxygen is detected in the stack gases). If this ~~were to~~ happen, the incinerator must be shutdown and placed in the purge cycle to remove the flammable gases.

III. OPERATING PROCEDURES (CONTINUED)

V. Incinerator (Continued)

Local Panel Switches

The chief operator must be familiar with all of the switches at each incinerator local panel. Care must be taken to assure that all switches are in their proper positions for safe incinerator operation. The following switches or pushbuttons are located on the local panel at each incinerator. Each local panel operates only the equipment associated with the specific incinerator that the panel is nearest. Figure 10 in the Appendix shows the local panel layout.

1. Air Blower Start Button - Starts the incinerator air blower.
2. Air Blower Stop Button - Stops the incinerator air blower.
3. Purge Start Pushbutton - Starts the unit purge cycle.
4. On-Off Switch - Can be used as ^{an} emergency shutdown switch.

Must be "on" for the incinerator to light.

5. ^{WARM-UP RUN}
~~Warm-Up/Run~~ Mode Switch - WARM-UP only allows the pilot flame to light. This will allow the temperature to run about 500-600°F. In the RUN position, the main flame can be lighted. When the main flame lights, the pilot kicks off after 10 seconds.

6. Burner Selector Switch (Low-Fire, High-Fire, Remote) - "Remote" allows control room operation of the burner. The incinerator can be placed in low-fire or high-fire from the local panel using the switch. The high-fire or low-fire switch on the local panel will only be used when lighting the incinerator or when troubleshooting the unit.

III. OPERATING PROCEDURES (CONTINUED)

V. Incinerator (Continued)

Local Panel Switches (Continued)

- → →
7. Burner Start Pushbutton - Ignites the flame for the pilot and/
or main burner by opening the fuel gas valves, ^{and energizing the spark} ~~depending on~~ igniter.
The WARM-UP/RUN mode switch position ^{determines which flame is lit.}

8. Horn Silence Button - Silences the alarm horn at the local panel.
9. Annunciator Lamp Test Button - Can be used to test the local alarm panel to make sure all lights are operational.

The following indicating lights are on the local panel:

- →
1. Blower On - Indicates that the motor is running on the air blower.
2. Purging - Indicates that air is purging the combustion chamber.
The purge time is set up on a timer that is adjustable by instrument maintenance personnel.
3. Purge Complete - Must come on before the pilot or main flame can light. It indicates that the purging timer has completed its cycle.
4. Pilot On - Indicates that the fuel gas valves to the pilot light are open.
5. Flame On - Indicates whether or not the pilot or main flame is lit, as seen by the flame scanner.

III. OPERATING PROCEDURES (CONTINUED)

V. Incinerator (Continued)

Start-Up Procedures

1. Set all circuits and safety limits for normal conditions as follows:
 - a. Set the total water flow (flow indicating switch downstream of the strainers) at ~~65 gpm~~ 80% on the ^{flowmeter} scale (46 gpm).
 - b. The "City Water" alarm on the local panel should be off.
See Troubleshooting procedures for clearing the alarm.
 - c. Set the scrubber water flow (flow indicating switch downstream of the ^bglove valve) at ~~65 gpm~~ 167% on the ^{flowmeter} scale (16 gpm).
 - d. The fuel gas pressure (pressure gauge downstream of the pressure regulator) at the incinerator should be 3 psig.
 - e. The steam pressure (pressure gauge upstream of the steam control valve) at the incinerator should be greater than 100 psig.
 - f. The liquid seal flame arrestor must be 1/3 to 1/2 full with liquid and the block valves between the supply drum and the flame arrestor must be closed.
2. Place the operation mode switch in the WARM-UP position.
3. Place the on-off switch in the ^{ON} ~~OFF~~ position and the burner selector switch on "low-fire" at the local panel. The automatic block valves in the fuel gas line must be closed (these should be closed in the low-fire position).

III. OPERATING PROCEDURES (CONTINUED)

V. Incinerator (Continued)

Start-Up Procedure (Continued)

4. Start the air blower by pressing the blower start pushbutton.

→ The "blower-on" indicating light should come on.

5. Turn the local burner selector switch to high-fire.

6. Tell the lead operator to switch the fuel gas temperature controller to manual and make sure the fuel control valve is wide open so that fuel gas flow to the main burner will not be restricted.

- 7. Check the combustion air pressure (~~1.5 psig~~) and purge air flow to the pyrometers. The combustion air pressure should be about 1.5 psig and a flow rate of 7.0 CFM is required to each pyrometer.

- 8. To start the purge cycle, ~~turn the on-off switch to the ON position and~~ ^{small letter} press the purge start pushbutton. The "Purging" light should come on. This light will remain on until the
→ purge cycle is complete and the "purge-complete" light comes on.

- 9. The pilot is ready to be ignited. Turn the burner selector switch to low-fire.

III. OPERATING PROCEDURES (CONTINUED)

V. Incinerator (Continued)

Start-Up Procedure (Continued)

-
10. Depress and hold the burner start pushbutton. The solenoid valves in the pilot line should open and the "pilot-on" light will come on indicating the flow of fuel gas to the pilot. If the pilot is ignited and the flame is proven within ten seconds, the "flame-on" light will come on. The burner push-button can then be released.
-
11. If the pilot flame has not been established within ten seconds after depressing the burner start button, the solenoid valves will close and the "pilot-on" and "purge complete" lights will go off. Turn the burner selector back to high-fire. The unit must be repurged starting from step 8.
-
12. After the pilot flame has been proven, the pilot will remain on until the operation mode switch is turned to the RUN position. In the RUN position, the solenoid valves in the main fuel gas line will open, igniting the main flame and after ten seconds the pilot solenoid valves will close. As long as the main burner flame is proven, the flame-on light will remain on. The incinerator is ready to proceed through a proper heat-up schedule (step 16).

III. OPERATING PROCEDURES (CONTINUED)

V. Incinerator (Continued)

Start-Up Procedure (Continued)

13. If the main burner does not ignite and the pilot flame is out, the main fuel gas solenoid valve will close. Turn the burner selector switch back to high-fire. The incinerator has to be restarted from step 8.
14. If the refractory does not require curing and the incinerator has not cooled to below 1000°F, the unit can be brought on line without proceeding through the heating schedule outlined below (step 16). Turn the burner selector switch to the "remote" position at the local panel. In the control room, the board operator controls the temperature rise by manually regulating the fuel gas control valve. The temperature should be raised approximately 125°F per hour. This can be observed by checking the refractory temperature indicators on the local panel at the incinerator. When the firebox temperature is above ¹⁵⁰⁰2000°F, the low temperature light on the control panel will go off and the ^{"READY"}ready light will come on.
15. When the ready light comes on, the lead operator will put the temperature controller for the fuel gas in automatic. The incinerator is now ready for inert venting.

III. OPERATING PROCEDURES (CONTINUED)

V. Incinerator (Continued)

Start-Up Procedure (Continued)

16. If the refractory must be cured, the combustion air and fuel gas valve will have to be unlinked temporarily. The air valve will be throttled as a means of temperature regulation during the first phase of the cure.
- a. Raise the temperature to 250°F during a three-hour period. Hold the temperature at this level for a minimum of sixteen hours. The continuous pilot will be used for this phase. The operation mode switch ~~should~~^{must} be on WARM-UP.
- b. Raise the temperature to 1100°F over a seventeen-hour period, at a rate of approximately 50°F per hour. This will require turning the operation mode switch to the RUN position ~~in the~~^{to} change over from pilot to low-fire main flame. ~~must occur during this time.~~ The pilot will only heat the incinerator to about 500-600°F.
- c. Increase the temperature at a rate of 100°F per hour to 1500°F over a four-hour period.
- d. Raise the temperature from 1500°F to 2400°F over a five-hour period, at a rate of approximately 175°F per hour. Relink the combustion air and fuel gas control and place the fuel gas controller on automatic. The "READY" light should come on at ~~2000°F~~^{1800°F} but the vents should not be vented until the incinerator has been heated properly to 2400°F.

III. OPERATING PROCEDURES (CONTINUED)

V. Incinerator (Continued)

Relighting Procedure

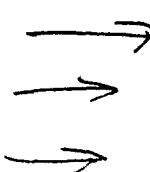
The following procedure will be used to relight either incinerator if it is shutdown during operation. The condition that caused the shutdown should first be corrected per the Troubleshooting procedures in this section. This procedure should not be used if the temperature has cooled below 1000°F. If the temperature is below 1000°F, refer to the Start-Up Procedures. The relighting procedure is posted on the local panel at each incinerator. The incinerator must be re-lit from the local panel.

1. The incinerator blower must be on.
2. The incinerator should be "ON" and in the RUN mode.
3. Put the burner selector switch in high-fire. The fuel gas control valve should be showing wide open on the control room indicator.
4. Press the purge start pushbutton. The "purging" light should come on.
5. When the "purge complete" light comes on (within three minutes), put the burner in low fire. The "purging" light should go off when the "purge complete" light comes on. *If the purge complete light does not come on, check the position of the fuel gas control valve per step 3 (above).*
6. Press and hold the burner start pushbutton. The "pilot on" light should come on and the "flame on" light should come on within ten seconds.

III. OPERATING PROCEDURES (CONTINUED)

V. Incinerator (Continued)

Relighting Procedure (Continued)

- 
7. When the "flame on" light comes on, release the burner start button. The "pilot on" and "purge complete" light should go off when the "flame on" light comes on.
 8. Put the burner in remote to allow operation from the control room.
 9. If the procedure is followed and the incinerator will not relight, instrument maintenance may be required. Notify the Shift Supervisor and follow his instructions.

Inerts Venting Procedure

Inerts are vented out of the old unit receivers to the on-line incinerator as needed. The inerts collect in the receivers and will cause the pressure to rise on the tanks. The new unit lead operator will monitor the receiver pressures and vent inerts to the incinerator if the pressure is above the maximum allowable pressure which is shown on the receiver pressure indicator, or upon the Shift Supervisor's instructions. The maximum allowable pressure is changed at the discretion of the Operations Supervisor.

NOTE: The receivers should not be vented ^{if} ~~of~~ the pressure is below the ^{given venting} ~~allowable~~ pressure. This will cause efficiency losses due to burning excessive VCM out of the receivers.

III. OPERATING PROCEDURES (CONTINUED)

V. Incinerator (Continued)

Relighting Procedure (Continued)

- 1. Check the indicator light on the incinerator to be vented to and make sure it is READY. If the READY light is not on, the LOW TEMPERATURE^{light} should be on, indicating that the incinerator temperature is less than 2000°F and cannot be vented to.
1800

- 2. When the READY light is on, press the high fire switch on the incinerator that is to be vented to. This opens the double block valves going to the incinerator. The HIGH-FIRE light will come on in the control room after a few seconds.

3. Set the inert flow controller setpoint at 3 roots of flow (300 SCFH). <

NOTE: Flows above 300 SCFH will cause channeling in the receiver chillers and will cause too much VCM to be burned and the inerts will not leave the receivers as fast. Flows below 300 SCFH will allow very slow venting of the inerts.

- 4. ~~It takes several minutes (5-7 minutes) for the ramp valve to open and for the flow to show on the flow indicator.~~ The lead operator will monitor the flow until it reaches the setpoint and lines out.

III. OPERATING PROCEDURES (CONTINUED)

V. Incinerator (Continued)

Relighting Procedure (Continued)

4. Record on the incinerator checklist the time that venting begins.
5. When the receiver pressure falls to below the ~~receiver~~ vent pressure, the lead operator will put the incinerator back in low-fire. The control valves ^{and double block valves} will close and the incinerator flow should drop to zero.
6. The lead operator will record the time that the vent ^{is} ~~was~~ shut off on the incinerator checklist.

Glycol Supply Drum Fill Procedure

The glycol supply drum holds ethylene glycol for filling the incinerator liquid seal flame arrestor as needed. Pressure is maintained at 10 psig on the supply drum using nitrogen. When the supply drum level gets below 1/4 full, glycol must be made up into the drum using the following procedure:

1. Move a 55-gallon drum of ethylene glycol to the supply drum area.
2. Install a drum pump in the drum of ethylene glycol.
3. Attached a hose from the discharge of the drum pump to the hose connection on the supply drum.
4. Check the valves in the outlet of the supply drum and make sure they are closed.

III. OPERATING PROCEDURES (CONTINUED)

V. Incinerator (Continued)

Glycol Supply Drum Fill Procedure (Continued)

5. Close the valve in the nitrogen supply line.
6. *Bleed the nitrogen pressure off of the pot using the pressure gauge bleed.* NOTE
6. Slowly open the valve in the ethylene glycol inlet line to the supply drum. *(See back)*
7. Fill the supply drum about 2/3 full.
8. Close the valve in the glycol inlet line.
9. Disconnect the pump from the supply drum.
10. Re-open the valve in the nitrogen supply line and make sure the pressure holds at 10 psig.

The flame arrestor can now be filled as needed from the supply drum. NOTE: Always Make sure the pressure on the glycol supply drum is higher than the pressure on the flame arrestor before filling the flame arrestor.

Control Room Panel Alarms

The following are control room panel alarms for the incinerator.

Steps that must be taken to correct the problem are given for each item.

Each incinerator can be normally shut down by *the panel* ~~a~~ switch in the control room or by the ^{ON - OFF} ~~on-off~~ switch at the local panel.

NOTE: The nitrogen blanket used on the ~~tank~~^{drum} can be dangerous. Nitrogen will displace oxygen and cause an oxygen deficient atmosphere if it is bled off of the tank too fast. Stay upwind of the vent and let the nitrogen bleed off slowly when venting the drum.

III. OPERATING PROCEDURE (CONTINUED)

V. Incinerator (Continued)

Control Room Panel Alarms (Continued)

The double block and bleed arrangement for the fuel gas and inert vent line will close automatically during all emergency shutdown conditions. When the incinerator is in a shutdown mode, the unit will be purged with air from the air blower. The air blower will continue to run unless the shutdown was caused by air blower failure. Steam will be used to purge the unit if the air blower fails. Steam flow should last two minutes. If the problem which created the shutdown cannot be solved in a short period of time, the blower should be shut off to avoid excessively cooling the refractory (to less than 1,000°F); however, do not shut the blower off until the steam line is blocked in. The steam purge comes on automatically anytime the air blower motor stops. The steam line should be blocked in to avoid cooling the refractory unnecessarily.

1. Incinerator Shutdown Alarm (or Shutdown Summary Alarm) - This

can be caused by any of the following emergency conditions which automatically shut down the incinerator:

- a. High fuel gas pressure *(5.0 psig setpoint)*
- b. Low fuel gas pressure *(0.3 psig setpoint)*
- c. Flame failure
- d. High firebox temperature *(2600°F setpoint)*
- e. Low water flow *(30 gpm setpoint)*

III. OPERATING PROCEDURES (CONTINUED)

V. Incinerator (Continued)

Control Panel Room Alarms (Continued)

1. Incinerator Shutdown Alarm (Continued)

f. Low combustion air pressure ~~x~~ (1 psig setpoint)

g. High quench effluent temperature ~~x~~ (180°F setpoint)

h. Air blower failure ~~x~~

i. Waste gas (inerts) high pressure (5 psig ~~setpoint~~ ~~maximum~~).

The lead operator will notify the chief operator ~~if necessary~~ that the incinerator has shutdown. The chief operator will proceed to the local panel to identify the problem per the local panel alarms and to correct the problem and restart the incinerator as soon as possible. Each potential problem will be discussed below.

2. High Firebox Temperature Shutdown or Refractory High Temperature (Setpoint 2800°F) - This alarm and shutdown should

normally follow a high firebox temperature alarm and condition (see below for corrective measures). If the alarm sounds,

check the temperature indicator for the firebox temperature as measured by the pyrometers. If normal conditions exist, the

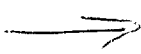
alarm indicates a burned out thermocouple. A maintenance work order should be processed as soon as possible ^{and the thermocouple repaired} since the unit will shutdown if the spare thermocouple burns out.

III. OPERATING PROCEDURES (CONTINUED)

V. Incinerator (Continued)

Control Room Panel Alarms (Continued)

3. High Firebox Temperature (Setpoint 2600°F)X

- 
- a. Check the pyrometer signals for error. Switch to the other pyrometer if this is the source of the problem.
 - b. Check the temperature controller to make sure the fuel gas valve is closed. The setpoint for the fuel gas temperature control valve should always be less than the setpoint for the steam temperature control valve. If the fuel gas valve is closed, the steam valve should be open.
 - c. Switch to low-fire if venting. In the low-fire mode have an outside operator check steam flow and pressure. If the temperature continues to rise, the unit will automatically shut down.
 - d. Check the combustion air pressure ^(must be above 44 inches of water) and line for sufficient air supply to the burner.

4. Low Firebox Temperature (Setpoint ¹⁸⁰⁰~~2700~~°F)X

- a. Check the temperature indicators to see if the controlling pyrometer signal is in error. If it appears to be drifting, switch to the other pyrometer for control.
- b. Check ^{the} steam temperature control valve for steam addition. The steam valve should be closed. The setpoint for the fuel gas temperature control valve should always be greater than the setpoint for the steam temperature control valve.

III. OPERATING PROCEDURES (CONTINUED)

V. Incinerator (Continued)

Control Room Panel Alarms (Continued)

4. Low Firebox Temperature (Continued)

- Check the fuel gas temperature controller to make sure the fuel gas valve is fully open. If the temperature continues to drop while venting, switch to low-fire.
- d. If the temperature is decreasing in the low-fire mode, have ~~an outside~~ ^{the chief} operator check the fuel gas flow and burner pressure. If the burner pressure is not normal, the burner may be plugged or the gas regulator may be malfunctioning. Shut the unit down *and correct the problem.*

- e. Check the combustion air pressure ~~and line~~ for sufficient air supply to the burner.

- f. *Check the fuel gas flow rate on the local indicator. At low fire the gas flow should show 30% on the meter (300 SCFH). If below 30%, check the gas valve linkage to see if it is loose or has slipped. Contact*
5. Steam Valve Open - This alarm comes on when the steam valve that is used for cooling comes on. Upon acknowledging the alarm, the lead operator should check the fuel gas valve to make sure it is closed. If it is not closed, either the fuel gas temperature control valve setpoint is set incorrectly or there is a malfunction in the instruments, requiring a maintenance work order. The setpoint for the fuel gas temperature control valve should always be set below the steam temperature control valve setpoint. The lead operator will also check the flow of inerts to the incinerator and may need to reduce the flow if it is too high. The flow should normally be set at 3 roots of flow (300 SCFH).
- Instrument maintenance for repair. the linkage it needed.*

III. OPERATING PROCEDURES (CONTINUED)

V. Incinerator (Continued)

Control Room Panel Alarms (Continued)

6. Malfunction Alarm (or Malfunction Summary Alarm) - This alarm *indicates that a malfunction alarm* is on at the local incinerator panel. The lead operator will notify the chief operator who will check the local panel and correct the alarm condition as soon as possible.
7. Total Water Low Flow (Setpoint 30 gpm) - A water flow less than 30 gpm through the total water flow meter will shutdown either incinerator if it is in the RUN mode.
- a. Check the water pressure before and after the strainer.
- If the pressure drop is excessive (more than 20 psig), switch to the spare strainer and clean the dirty strainer as soon as possible. *Each incinerator has a separate set of strainers.*
- b. Check the water valves to make sure they are open from the cooling water blowdown line to the total water flow meter.
- c. Check the total water flow globe valve and open it as needed to get the flow back to the required 46 gpm.
8. Exhaust Stack Low O₂ Concentration (Setpoint % Oxygen) - This alarm comes on if the oxygen in the exhaust stack gases *f*alls below 2 percent.

III. OPERATING PROCEDURES (CONTINUED)

V. Incinerator (Continued)

Control Room Panel Alarms (Continued)

If this alarm comes on, the incinerator must be shutdown and placed in the purge cycle to remove the flammable gases. The fuel gas and combustion ^{air} ~~in~~ control valves linkages should also be checked to make sure they are tight and that proper amounts of air are being fed to the burner.

9. Incinerator Feed, High VCM Concentration (Setpoint % VCM) -

This alarm comes on in high fire if the VCM concentration in the inert gas stream rises to % VCM according to the inlet gas analyzer. The following should be checked:

- a. Check the receiver pressure. If it is below the set venting pressure, put the incinerator in low-fire to stop the flow of VCM to the incinerator.
- b. Have the chief operator check the operation of the Frick refrigeration unit. The chief operator should make sure that the switch is on to the receivers that are in service and that the suction (35 psig) and discharge pressures (125-150 psig) are normal.

III. OPERATING PROCEDURES (CONTINUED)

V. Incinerator (Continued)

Control Room Panel Alarms (Continued)

10. Incinerator Feed High O₂ Concentration (Setpoint % Oxygen) -

This alarm indicates that the oxygen concentration in the inert gas feed stream is too high, as measured by the inlet gas analyzer. This could cause a potentially explosive condition. All sources of getting air into the recovery system should be checked and any valves open to the atmosphere must be closed. Notify the Shift Supervisor for instructions.

The two following alarms are control room panel alarms for the west incinerator that are not included on the east incinerator control room panel:

11. High Quench Effluent Temperature (Setpoint 160°F) -

- a. Check the temperature controller to make sure the incinerator operating conditions are normal and that steam is properly cooling the combustion chamber as needed.
- b. If the incinerator water flow is below 46 gpm, adjust it as needed to reach the desired flow. Switch water strainers, if needed.
- c. If the temperature does not drop, put the incinerator in low-fire to lower the temperature. Temperatures above 180°F can damage the water scrubber and will shutdown the incinerator.

III. OPERATING PROCEDURES (CONTINUED)

V. Incinerator (Continued)

Control Room Panel Alarms (Continued)

12. City Water On (Setpoint 35 gpm) - Cooling water flow switches

automatically to city water if the total water flow drops to
below 35 gpm. ^{for each incinerator is} A manual switch north of the D-500/600/700
^{and manually} cooling tower ^{either} is used to switch ~~back~~ to tower water or city water.

a. Check to make sure the cooling water blowdown line is
not blocked in or plugged.

b. If the switch was caused by a power outage, do not reset
the valve until the power has been restored completely.

c. ^{Reset} the manual switch to use tower water when the normal
^{flow rate} flow is re-established.

The following alarms for the liquid level in the liquid seal flame
arrestor are also located in the control room, ~~near the pushbuttons~~
~~for the west incinerator:~~

13. High Liquid Level, Flame Arrestor - Have the chief operator

check the flame arrestor and the glycol supply drum to make
^{the valves between them are} sure ~~they are~~ closed.

14. Low Liquid Level, Flame Arrestor - Have the chief operator

check the flame arrestor for leakage, especially the sample
valve and bleed valve on the level gauge.

III. OPERATING PROCEDURES (CONTINUED)

V. Incinerator (Continued)

Local Panel Alarms

The following alarms are shown on the annunciator panel at the local control panel for each incinerator. The chief operator must take the necessary steps to correct each condition and clear the alarm as soon as possible when one of these alarms go off. Each alarm either causes a malfunction or shutdown alarm on the control room panel and the lead operator will notify the chief operator when either of the alarms go off. Items 1-7 are malfunction alarms and items 8-16 are shutdown alarms.

1. Low Scrubber Water Flow (Setpoint 3.5 gpm)

- a. Immediately check the water pressure at the gauges near the total flow indicating shutdown switch. If ^{there is} more than a 10 psig differential pressure, switch to the spare strainer.
- b. If the water flow has ^{not} increased after switching strainers, open the globe valve for the scrubber water further.

2. High Quench Effluent Temperature or High Scrubber Temperature
(Setpoint 160°F) - See item 11 under Control Room Panel Alarms.

III. OPERATING PROCEDURES (CONTINUED)

V. Incinerator (Continued)

Local Panel Alarms (Continued)

→ 3. High Quench Tank Level (Setpoint 10" Water Column) X

- a. Check the water flow at the total water flow indicator.
If the flow is above 50 gpm (100% on the scale), close the globe valve at the quench tank until flow is about 46 gpm (90% on the scale).
- b. Open the drain valve on the quench drain seal leg. Close the valve after the level drops below the high level setpoint.
- c. If the incinerator is in the high-fire mode of operation, put it in the low-fire mode. If the level does not decrease immediately, close the globe valve for the quench tank feed. Do not decrease the flow below the setpoint for the low total water flow (60% on the scale).
- d. If a high level continues and burner operation becomes erratic (increased gas and air pressure at the burner, poor temperature control, etc.), shut the unit down before the water level reaches the firebox. After the unit is shutdown, block in water flow to the unit and drain the level until it reaches ^{the} normal operating ^{level.} conditions.

III. OPERATING PROCEDURES (CONTINUED)

V. Incinerator (Continued)

Local Panel Alarms (Continued)

-
4. High Fuel Gas Pressure (Setpoint 3 psig) X
 - a. Check the fuel gas pressure regulator. It may be stuck partially open.
 - b. Decrease the setpoint for the fuel gas temperature control valve. Observe the burner pressure at the pressure gauge located downstream of the fuel gas control valve. If *the* pressure does not decrease, the burner may be plugged. Shutdown of the unit may be required to unplug the line.
 5. Steam Low Pressure (Setpoint 60 psig) - Sufficient steam pressure is needed for cooling the incinerator in high-fire. The chief operator will instruct the lead operator to put the incinerator in low-fire until steam pressure is regained.
 6. City Water On (Setpoint 35 gpm) - Set^e Control Panel Alarm Number 12 (*above*).
 7. Refractory Thermocouple Failure - Indicates a malfunction in one of the thermocouples. Use the spare thermocouple and have the broken one repaired as soon as possible.

III. OPERATING PROCEDURES (CONTINUED)

V. Incinerator (Continued)

Local Panel Alarms (Continued)

8. Waste Gas (Inerts High Pressure (Setpoint 5 psig)) - The incinerator being vented to will shut down if the inerts pressure at the incinerator exceeds 5 psig. Check the pressure control valve setpoint ^{at the receivers and the flow rate to the incinerator} and reduce ~~it~~ ^{them} prior to re-starting the incinerator. Monitor the pressure following startup. Watch for excessive cycling or the pressure switch may be defective. Write instrument maintenance work orders for repairing these as soon as possible.
9. Low Fuel Gas Pressure (Setpoint 0.3 psig) - The incinerator flame may not be able to be sustained if the fuel gas pressure falls below 0.3 psig. Check the fuel gas regulator and pressure switch and make sure the valves are fully open.
10. Fuel Gas High Pressure (Setpoint 5 psig) - Follow the same steps given for the malfunction alarm, number 4 (above).

III. OPERATING PROCEDURES (CONTINUED)

V. Incinerator (Continued)

Local Panel Alarms (Continued)

11. Combustion Air Low Pressure (Setpoint 1 psig) - Proper oxygen levels are necessary for safe incineration of the inerts. If the air blower pressure falls below 1 psig going into the burner, the unit will shut down. Check the air blower suction ^{suction}~~filter~~ for pluggage and make sure the blower is running. Then check the pressures using correct gauges and check the pressure switch.
12. Air Blower Failure - Failure of the air blower motor will shut down the incinerator. Check the blower motor and/or have the shutdown switch checked. The air blower must be running or the unit will not startup.
13. Refractory High Temperature (Setpoint 2800°F) - Same as number 2 under Control Panel Alarms.
14. Flame Failure - Indicates that the flame scanner cannot see a flame. Maintenance may need to pull and clean the face of the scanner. If the incinerator will not light, the valve linkages should be checked. Improper valve settings due to loose linkages will cause smoking in the combustion chamber and will coat the flame scanner with soot.
15. Low Total Water Flow (Setpoint 30.0) - Same as number 7 under Control Panel Alarms (above).

III. OPERATING PROCEDURES (CONTINUED)

V. Incinerator (Continued)

Local Panel Alarms (Continued)

16. Scrubber High Temperature Shutdown (180°F) - Take the steps given in number 11 under Control Panel Alarms (above).

DTH 000112170

III. OPERATING PROCEDURES (CONTINUED)

J. Methocel Makeup

General Information

→ The methocel solution used in the plant is a 1.5% solution of Methocel in water. The methocel must be mixed with water, heated and agitated for a specified length of time, then cooled to make a good quality colloid solution. The "A" operator must makeup methocel as soon as possible after the methocel makeup tank is emptied to prevent reactor charging downtime. The methocel makeup procedures must be followed very carefully by the "A" operator. Methocel makeup has a big effect on the particle size of the resin produced. Carelessness in making up methocel can cause several reactor coarse batches resulting in ~~very~~ large product losses. Every "A" operator must be careful to makeup methocel exactly by the procedures, everytime. Care should ^{also} ~~be~~ be exercised when working in the methocel tank area. Methocel is very slick and spills will present a dangerous slipping hazard.

Procedure

1. When the methocel makeup tank comes empty, the "A" operator will notify the lead operator that he is going to makeup methocel.
2. If necessary, the "A" operator will rinse the colloid makeup tank with water to the sewer until it is clean. This will require opening two valves to the sewer drain. The methocel

III. OPERATING PROCEDURES (CONTINUED)

J. Methocel Makeup (Cont.)

Procedure (Cont.)

transfer pump discharge valve into the methocel charge tank must be closed when rinsing out the makeup tank to prevent getting water accidentally into the charge tank. This valve is at the top of the charge tank. Buildup of undissolved methocel in the tank must be cleaned out of the tank for methocel makeup to be consistent. Close the valves to the sewer after rinsing the tank and re-open the valve to the charge tank.

3. The "A" operator will close the valve at the bottom of the methocel makeup tank^{so} that transfer cannot ⁺ take place during makeup.
4. The "A" operator will take 3 bags of Dow F-50 Methocel powder (50 pounds per bag) to the top of the colloid makeup tank. The lead operator will check to see if the charge water pumps are available for making up methocel when notified by the "A" operator. As soon as the pumps are available he will notify the "A" operator that he is ready to put hot water into the methocel makeup tank. The charge water pumps should not be used for any other operation while charging hot water into the methocel makeup tank.

III. OPERATING PROCEDURES (CONTINUED)

J. Methocel Makeup (Cont.)
Procedure (Cont.)

5. The "A" operator will proceed to the top of the methocel makeup tank and tell the lead operator to start the charge water pump.
6. The lead operator will:
 - a. Put the charge water temperature controller in manual and close the valve.
This prevents cooling off the water charged into the methocel makeup tank which will lengthen the solution heat-up time.
 - b. Turn on one charge pump.
 - c. Open the pump discharge valve.
 - d. Monitor the hot water charge counter on the panel and reset it to zero when it stops counting.
 - e. Tell the "A" operator to open the hot water valve going into the makeup tank.
7. The "A" operator will open the valve and monitor the water flow into the tank when the lead operator notified^s him to open the valve.
8. The "A" operator will let the water flow into the makeup tank until it touches the top agitator blade. This will be a little more than half full and the water counter will show about 72 counts. He will then shut the hot water valve at the tank, and tell the lead operator to cut off the charge pump.

III. OPERATING PROCEDURES (CONTINUED)

J. Methocel Makeup (Continued)

Procedure (Continued)

9. The lead operator will then close the hot water charge pump, discharge valve, shut off the pump, and put the hot water charge temperature controller back in automatic.
10. The "A" operator will use the following steps to finish the methocel solution makeup:
- Start the makeup tank agitator.
 - Open the steam valve to the jacket and the jacket ^{dr}~~main~~ valve to the sewer.
 - Allow the water to heat to 180°F.
 - Shut the steam valve to the jacket and the jacket drain valve to the sewer.
 - Carefully cut the bags ^{of Methocel} open with a safety knife. Add the ~~M~~ethocel powder very slowly with the agitator on. Each bag should take about one minute to add. If the powder is added too quickly, it will form lumps and not dissolve properly. Be careful not to drop the bag into the tank. Carry the empty bags to a trash container.
- NOTE: ^{↓ TS} A dust mask must be worn while adding the methocel ^{↓ TS} powder to the hot water.
- ^{↓ TS} Allow thirty minutes to let the agitator thoroughly mix the powder into the hot water. Visually check the mixture for lumps and continue to mix if lumps are present after thirty minutes.

III. OPERATING PROCEDURES (CONTINUED)

J. Methocel Makeup (Cont)

Procedure (Cont)

- g. When the mixture contains no lumps, open the cold water valve to the tank and fill the tank until the outage is 3 inches from the top of the tank.

NOTE: If there is a lot of foam on top of the solution, fill the tank until the foam gets to the top of the tank. Return to the tank in about 30 minutes and most of the foam should have dissipated and the tank can be filled up to a 3 inch outage.

- h. Start the methocel makeup tank cooler as soon as cold water is added to the tank. This will require opening the cooling water inlet and outlet valves.

- i. Monitor the temperature of the tank while it is cooling. When the temperature is 85°F, close the cooling jacket valves and turn off the agitator. It is very important to cool the colloid solution completely each time to produce a good quality colloid solution.

- j. A sample of the solution can be taken when it reaches 95°F. Make sure the tank temperature is 95°F or below before sampling. Use the following sample procedure:

III. OPERATING PROCEDURES (CONTINUED)

J. Methocel Makeup (Cont)

Procedure (Cont)

- (1) Obtain a ^{clean} 2 oz. glass jar for sampling.
- (2) Go to the top of the makeup tank and fill the jar with methocel solution.
- (3) Pour the bottle contents back into the tank to flush out the bottle.
- (4) Refill the bottle and put a clean cap on it.
- (5) Rinse off your hands and the bottle.
- (6) Take the sample to the lab and log it in on the methocel log for analysis. Be sure to notify lab personnel that you brought the sample so they can check it as soon as possible.

11. The lab will analyze the sample by both the scope test and oven test. If the scope test is good and methocel is needed for charging, enough methocel can be pumped over to complete the charge upon the Shift Supervisor's instructions. The oven test takes about two hours to complete. If it should come up bad, there will still be time to add methocel to the reactor that was charged per the scope test result. Both tests have to have a result of 1.40% solids to 1.60% solids for the batch to be acceptable. If either result is not within specification, resamples must be taken and the Shift Supervisor's instructions followed as to whether ^{or not} a new batch must be madeup.

III. OPERATING PROCEDURES (CONTINUED)

J. Methocel Makeup *(Continued)*

Troubleshooting

1. The Tank Will Not Heat Up - Check the cooling water valve for leakage. It may be leaking by and cooling off the tank.
2. The Tank Will Not Cool Down - Cooling in the old unit is very slow, sometimes taking four or five hours. If the tank is cooling off at a slower rate than normal, check the jacket valve and make sure it is not leaking through.
3. Agitator Will Not Run - This requires an emergency maintenance work order. Methocel cannot be madeup unless properly agitated.