VI. TENTATIVE OPERATING INSTRUCTIONS (contd.)

F. REBOILER FURNACE

4. Control Loops, Interlocks, and Alarms

b. Interlocks (contd.)

2) The following interlocks will shut down only the individual burners affected.

a) Pilot Flame Failure. If a pilot flame is not lit, the burner will shut down and the burner light on the field panel will be off.

b) High (_____#) or low (_____#) gas pressure when on gas only low fuel oil pressure (_____#) and/or low atomizing steam pressure (_____#) will shut down a burner, when on fuel oil only.

c) Individual on-off switch on the field panel to "off" position.

d) Individual stop button on the field panel has been pushed.

c. Alarms

There are two other alarms related to the furnace which are not mentioned under interlocks.

1) When starting up the furnace, an alarm should sound after the power switches have been turned on, indicating the interlocks have been satisfied. This alarm sounds each time a burner is shut down.

2) There is a high and low level alarm on the fuel oil storage tank. The indicator is located on the tank. The low level alarm will come in at about 10% or at an air signal of 4#, and will light the telelarm panel marked, "Furnace fuel oil tank low level". The high level alarm will come in at about 90% or at an air signal of 14# and will light the telelarm panel marked, "Furnace fuel oil tank high level".

5. Startup Instructions

a. For using natural gas.

1) Check to see that an adequate flow of crude Aroclor exists through the furnace by checking the flow indicator on the northwest corner of the furnace. The indicator should read at least 7, which corresponds to a flow of 420 GPM. If this flow rate is not at least this large, an interlock will prevent the furnace from starting.

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VI. TENTATIVE OPERATING INSTRUCTIONS (contd.)
F. REBOILER FURNACE (contd.)

5. Startup Instructions (contd.)

2) Open the following manual valves:

a) Two in each of the three pilot gas lines.

b) Two in each of the three gas lines to the burners.

c) One in the main gas line ahead of the pressure regulator, PCV-503.

3) Verify that the pressures in the gas line on the furnace side of the following pressure regulators read as indicated.

a) The pressure control valve on the gas entering the department (PCV-307-3) ahead of the gas meter; PG-307-3 located there should read 45#.

b) PCV-503 at the furnace controls; PI-504 on the burner feed should read 30#.

c) PCV-BPI-1 in the pilot feed line; PI-BPI-2 should read 2# (all three).

4) Check that the fuel flow controller selector switch on the field panel is set to run on gas. A blue light on the control room panel will indicate the switch is on natural gas.

5) Set the fuel flow controller in the control room to manual and close the valve.

6) Turn the low fire switches on the field panel to the "start" position.

7) Turn on the main power switch and the other power switch on the field panel. The light on the main power switch should now be on and the alarm should sound indicating the interlocks are satisfied. Turn off the alarm on the field panel. If there is no alarm, check to see which interlock is not satisfied.

8) Have supervision gas test the inside of the heater if it has been down for over ____ hours.

9) Turn the three burner switches on the field panel to "on".

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VI. TENTATIVE OPERATING INSTRUCTIONS (contd.)

F. REBOILER FURNACE (contd.)

5. Startup Instructions (contd.)

10) Push the purge button on the field panel. The light should go on if it is working.

11) When the purge cycle is complete, the "safe start" green light on the field panel should go on and the red "interlock ready" lights on the field panel will go on if the fuel pressure is high enough. This should automatically open the pilot block valves and light the pilot flames.

12) If the pilot flame detector detects a flame, the amber burner lights on the field panel will be lit. After the system has completed a purge cycle and a burner is proved, the next burner can be started up without repurging.

13) If a pilot does not light, the amber burner light will not be on but the red interlock ready light will be on. To restart, push the green reset button inside the inner door of the field panel corresponding to the burner not lit. Hold the start button in until the amber light goes on.

14) When the amber lights are on, the manual reset valve in the burner line should be opened.

15) Open the three manual "Maxon" valves.

16) Turn the low fire switch to "run".

17) The furnace can now be controlled using the flow controller (FIC-307-1) located on the control room panel. Set this to the desired setting when ready and switch to automatic control. When heating up the still pot crude at the start of a column run, set the flow controller on 7.5. During distillation the set point should be 4.2.

b. For using fuel oil.

1) Check the level of the fuel oil storage tank to see if there is adequate fuel and the pump to see that it is circulating the fuel oil. The level indicator is located at the storage tank. It takes 13% to make a column run on oil.

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VI. TENTATIVE OPERATING INSTRUCTIONS (contd.)

F. REBOILER FURNACE (contd.)

5. Startup Instructions (contd.)

2) Check the flow indicator on the northwest leg of the furnace to see that it reads at least 7 or 420 GPM. If less than 7, an interlock will prevent the furnace from lighting.

3) Open the manual valves in the following lines:

a) The two valves in each oil line to the main burners.

b) The valve in the line between the pump discharge and the filters.

c) The two valves in the lines to and from the filter for the filter being used.

d) The valve in the 80# steam ahead of the pressure control valves.

e) Manual valves for pilot gas.

4) Check the steam pressure on the steam supply line. It should read 80#.

5) Make sure the bypass block valves between the oil and steam lines to each burner are closed.

6) Put the fuel selector switch on "Oil". This turns on the green light in the control room and allows the controller to operate the control valves in the oil lines.

7) Set the fuel flow controller (FIC-307-1) on the control room panel to manual and close the valve. Check to see if bypass lines around the control valves are open.

8) Turn the Lo fire switches on the field panel to "start".

9) Turn on the main power switch, and the other power switch on the field panel. The light on the main power switch should now be on and the alarm should sound, indicating the interlocks are satisfied. Turn the alarm off on the field panel. If there is no alarm, check to see which interlock is not satisfied.

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VI. TENTATIVE OPERATING INSTRUCTIONS (contd.)

F. REBOILER FURNACE (contd.)

5. Startup Instructions (contd.)

10) If the furnace has been down for more than _____ hours, have supervision gas test the inside of the heater.

11) Turn the three burner switches on the field panel to "On".

12) Push the "Purge" button on the field panel. The light should go on if it is working.

13) If the purge cycle is complete, the "safe start" green light on the field panel should go on and the red "interlock ready" lights on the field panel will go on if the fuel pressure is high enough. This should automatically open the pilot block valves and light the pilot flames. The pilot lights run on natural gas at all times.

14) If the pilot flame detector detects a flame, the amber burner lights on the field panel will be lit. After the system has been purged and a burner is proved, the next burner can be started without repurging.

15) If a pilot does not light, the amber "burner" light will not be on but the red "interlock ready" light will be on. To restart, push the green reset button inside the inner door of the field panel corresponding to the burner not lit. Hold the start button in until the amber light goes on.

16) When the pilot flames have been proven (all three amber lights on), the automatic block valve in the steam line opens.

17) Purge all three burners with steam for 5-10 minutes by opening the manual valve in the steam control valve bypass line.

18) Open the manual reset valve in the burner line.

19) Open the three "Maxon" valves in the oil line and turn the "Lo Fire" switch to "Run" on the field panel. You should be running at low fire.

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