

**Fermi National Accelerator Laboratory
Batavia, IL 60510**

HYDRO-THERM SYSTEM OPERATION PROCEDURE

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Revision Page

<u>Revision</u>	<u>Revision Description</u>	<u>Date</u>
A	Added; Revision Page. Step 3.1 Added after the word disconnect; #10. After the first sentence; Turn PP/IB2/3 circuit 31, 33, and 35 to off. Bleed the N ₂ head to zero on the expansion tanks. After the word Power; and Stored Power. TRR No. 0352	4/13/95

Note(s):

The Hydro-Therm Heating / Cooling System is to be operated only by Trained/Approved Technicians

1.0 Hydro-Therm Heating / Cooling System Checks

1.1 System Check

- 1.1.1 Hydro-Therm Disconnect - OFF
- 1.1.2 Hydro-Therm Control Panel Switch for the Pumps - OFF
- 1.1.3 Hydro-Therm Control Panel Switch for the Heaters - OFF
- 1.1.4 Auto Cool / Heat Disconnects - OFF
- 1.1.5 Auto Cool / Heat Control Panel Switches - OFF
- 1.1.6 Check the Gas N2 Head 10-20 Lbs. and bottle status.
 - Temperature 0° to 200° will require at least 10 psig
 - Temperature 200° to 250° will require at least 20 psig
- 1.1.7 Set the Valve Alignment for the Flow Path.

2.0 Start Up Procedure

- 2.1 Set the Valve Alignment for flow.
- 2.2 Turn the 480 Volt Power Disconnect - ON
- 2.2 Turn the Hydro-Therm Disconnect - ON
- 2.3 Check the Auto Cool / Heat Valve Disconnects to ensure that they are in the off position (Manual Operation).
- 2.4 Check the Auto Cool / Heat Control Panel Switch to ensure that they are in the off position (Manual Operation).
- 2.5 Set the Hydro-Therm Computer Heat Temperature Control (Supervisor Only).
- 2.6 Heating Cycle
 - 2.6.1 Turn on the Hydro-Therm Control Power Switch. The Low Level alarm will sound, push the silence button.
 - 2.6.2 Using the Computer, set in Auto Mode, push the temperature up or down arrows to set the correct temperature.
 - 2.6.3 Turn on the Circulating Pump. Check the Pump Pressures.
 - Supply 80 TO 85 psi
 - Return 15 TO 20 psi

- 2.6.4 Turn on the Heaters. Check the Fluid temperature to make sure that it regulates at the set temperature $\pm 10^\circ$. The temperature should never be allowed to rise above 250° . If the temperature ever does rise above 250° , shut off the Heaters and leave the Circulation Pump run for at least 10 minutes. Inform the Production Manager, then shut off the Circulation Pump and make sure that the Fluid Temperature does not rise.
- 2.6.5 Turn the Control Panel Disconnect to the off position. The Hydro-Therm System is now secure.

3.0 Emergency Shut Down Procedure

- 3.1 Turn the Control Panel Disconnect Switch to the off position, then turn the 480 Volt disconnect #10 to the off position (Located on the Wall). Turn PP/IB2/3 circuit 31, 33, and 35 to off. Bleed the N₂ Head to zero on the expansion tanks. All Electrical Power and Stored Power is now removed from the Hydro-Therm System.

4.0 Hydro-Therm Cabinet Valve Alignment - Heating

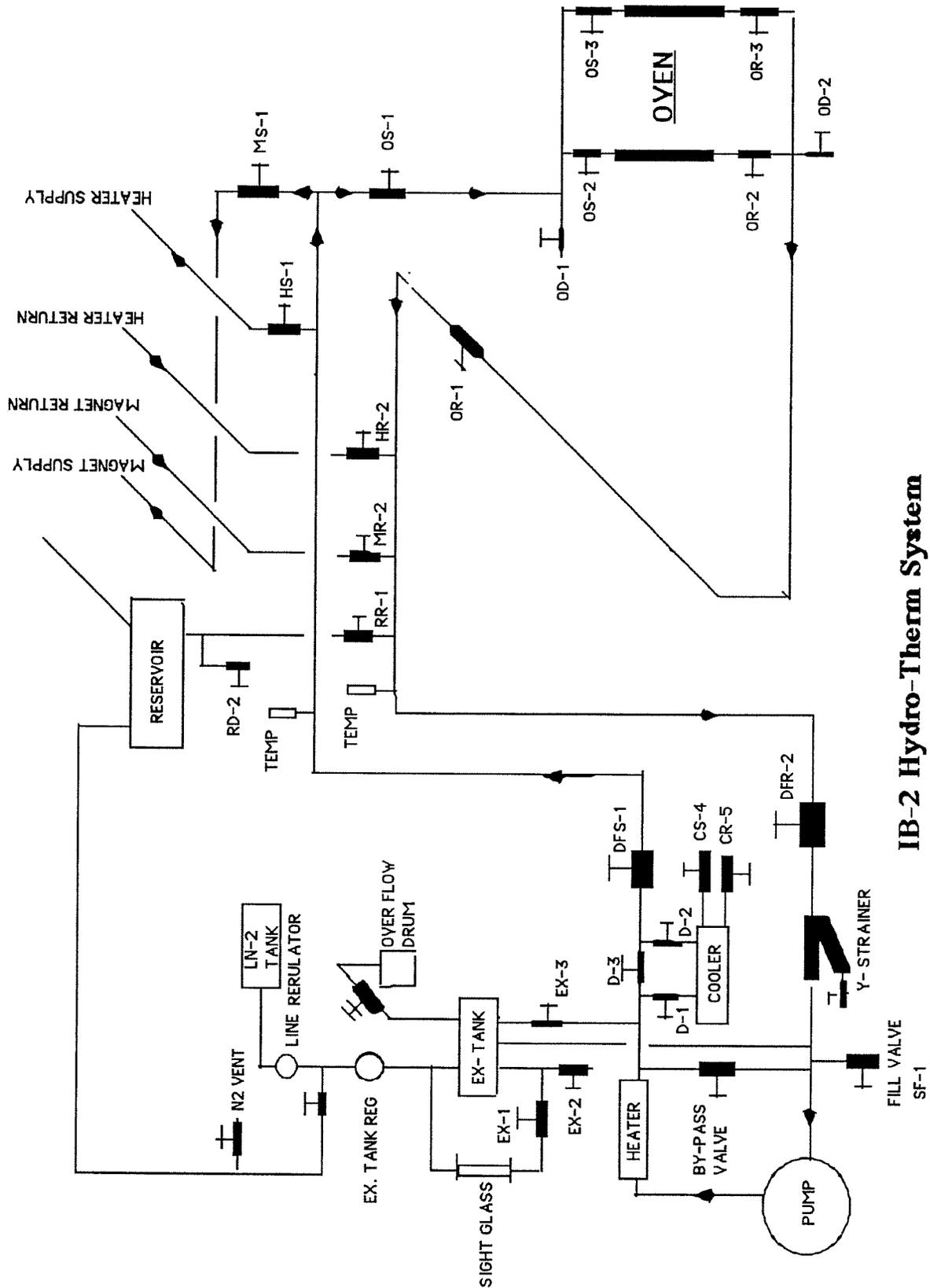
- (EX-1) Expansion Tank Sight Glass Valve- OPEN
- (EX-2) Expansion Tank Drain Valve - CLOSED
- (EX-3) Expansion Tank Pressure Valve - CLOSED
- (SF-1) System Fill Valve - CLOSED
- (Y-1) Strainer Valve - CLOSED
- (DFS-1) Hydro Supply Valve - OPEN
- (DFR-2) Hydro Return Valve - OPEN
- (BY-PASS) Supply to Return Valve - CLOSED
- (D-1) Dow Frost Cooler Supply Valve - CLOSED
- (D-3) Dow Frost Cooler Bypass - OPEN
- (D-2) Dow Frost Cooler Return - OPEN
- (CS-4) ICW - CLOSED
- (CS-5) ICW - CLOSED
- (N-2) Nitrogen Regulator Set to 10 - 20 psig

5.0 Dow Frost Valve Alignment - Oven Heating

- (RR-1) Reservoir Return - CLOSED
- (MR-2) Magnet Return - CLOSED
- (HR-2) Heater Return - CLOSED
- (HS-1) Heater Supply - CLOSED
- (MS-1) Magnet Supply - CLOSED
- (OS-1) Oven Supply - OPEN
- (OS-2) Oven Bottom Supply - OPEN
- (OS-3) Oven Bottom Supply - OPEN
- (OR-1) Oven Return - OPEN
- (OR-2) Oven Top Return - OPEN
- (OR-3) Oven Top Return - OPEN
- (OD-1) Oven Drain - CLOSED

6.0 Dow Frost Valve Alignment - Heaters

- (RR-1) Reservoir Return - CLOSED
- (MR-2) Magnet Return - CLOSED
- (HR-2) Heater Return - OPEN
- (HS-1) Heater Supply - OPEN
- (MS-1) Magnet Supply - CLOSED
- (OS-1) Oven Supply - CLOSED
- (OS-2) Oven Bottom Supply - OPEN
- (OS-3) Oven Bottom Supply - OPEN
- (OR-1) Oven Return - CLOSED
- (OR-2) Oven Top Return - OPEN
- (OR-3) Oven Top Return - OPEN
- (OD-1) Oven Drain - CLOSED



IB-2 Hydro-Therm System