

STANDARD OPERATING PROCEDURE # FAC 6.007

Subject: Manual Chiller Start-Up in Building 40

Purpose and Scope: Operations procedure to start (1280 Ton) chillers in “HAND” mode located in building 40.

Starting Sequence:

1. Turn VFD on in “**HAND**” and set to 60 hertz using up and down arrows, the correct cooling tower pump for the chiller to be started. Verify flow visually by the pressure gauge at the pump and the water movement in the tower. The pumping capacity is 3600 GPM, through the condenser that is controlled by two flow control valves in the condenser piping.
2. Turn cooling tower fan VFD on in “**HAND**” for the correct cooling tower for the chiller that is to be run. The fan VFD should be adjusted to supply a minimum of 65°F and maximum of 85°F cooling tower water to the chiller.
3. Verify that the secondary VFD pump(s) for the campus chilled water system are in operation and pumping no less than 1600 GPM for each chiller(s) running. If not, adjust the speed to this minimum. Check the flow by looking at Onicon panel located beside the VFD’s.
4. Turn chiller chilled water pump VFD on in “**HAND**” for chilled water flow to the chiller that you want to operate and set to 47 hertz using up and down arrows. Check the seals on the pump to insure no leakage and also verify flow at the pressure gauge on top of the pump.
5. At the chiller control panel, turn HOA switch to “**HAND**” position and push the **AUTO** button on UPC2 panel located on chiller. At this time the chiller computer runs a series of diagnostic checks on the machine, verifies that the cooling tower water pressure differential switch is made, the evaporator pressure differential switch is made. The computer also automatically starts the chiller oil pump, which runs in a pre-lube state for approximately 30 seconds to lubricate the motor bearings. If all conditions are acceptable the machine will start and the cooling cycle will begin.
6. While at the chiller control panel, press the “**Custom Report**” button. This report has been setup to allow the operators on duty to monitor important operating information. Use this during startup to confirm proper operation, and during your hourly equipment checks to

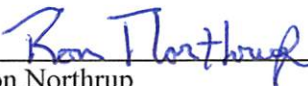
make sure that the machine is operation within its proper range. This information will let the operator know if more/less cooling is needed.

Shut Down Procedure:


1. To shut down a machine is basically the reverse of the startup with the exception of the “**Stop**” button. When you push the “**Stop**” button, only push it **ONE** time. If you push it two times, it will put it into a panic stop mode, which will stop it at once and could damage the machine. This is not good for the machine due to it stops under a loaded condition. Not only does it stop the machine at once it also stops the oil pump at this time and this does not allow the bearings to be cooled down by the oil as in a post lube normal shut down. Only push the “**Stop**” button one time for normal shut down. This will allow the machine to un-load before turning off. It also allows the oil pump to continue to run for approximately 1 minute in a post lube mode to further cool the motor bearings off. This adds a great deal of life to the bearings and the machine.

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