OCN 7.5.5 R/V Oceanus Distillation Plant Operation

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1. Purpose

The purpose of this procedure is to set forth the guidelines for running starting the HJ50 Evaporator.

2. Responsibility

It is the responsibility of the Chief Engineer to maintain guidelines for this procedure.

3. General

This procedure is to be used for starting the HJ50 Evaporator.

Procedure for running off main engine at sea speed (above 600 rpm)

1. Line up salt-water valves: (3 total: inlet off main salt water header, pump discharge and overboard valve.)
2. Assure the vacuum breaker valve is open and start the salt water pump. (Pump pressure should be a minimum of 40 psi.)
3. Check over pump and piping. Close vacuum breaker and start pulling a vacuum.
4. Check chemical tank and line up feed rate at 100 cc per minute.
5. When evaporator shell vacuum is at least 25”, line up jacket water side for heat.
6. Open inlet and outlet valves to lower tube nest and close the bypass.
7. Line up jacket water valves to and from the engine.
8. Start jacket water pump on HAND only.
9. You should see temperature rise at the inlet and outlet sides of the lower heat exchanger. There should also be a temperature drop of at least 10-15 degrees across the heat exchanger.**
10. Give evaporator a few minutes to start producing distillate (5-10 minutes) then line up your fresh water valves to the tanks. (Total number of valves = 4.)

11. Start the distillate pump and turn on the salinity indicator. Evaporator should begin dumping to the bilge initially and then slowly clear within 10 minutes.

** At ship's cruising speed (above 600 rpm), the engine jacket water temperature should be sufficient to maker water. Should there be a need for more heat, the boiler hot water circulating pump can be put on line. To put the boiler how water circulating pump on line, start in the "auto" mode which regulates the temperature according to the thermostat bulb located at the outlet of the lower tube nest in the jacket water piping.

Procedure for running with engine at idle off oil boiler

1. Line up and start oil-fired boiler, and secure electric water heater. To start oil-fired boiler, line up fuel supply valve and turn on boiler. Boiler will fire when thermostat calls. There is a low/high fire switch to select the rate for the boiler on the solenoid controls. Boiler is run at high fire for the evaporator.

2. Line up salt-water valves: (3 total: inlet off main salt water header, pump discharge and overboard valve.)

3. Assure the vacuum breaker valve is open and start the salt water pump. (Pump pressure should be a minimum of 40 psi.)

4. Check over pump and piping. Close vacuum breaker and start pulling a vacuum.

5. Check chemical tank and line up feed rate at 100cc per minute.

6. When evaporator shell vacuum is at least 24", line up jacket water side for heat.

7. Open inlet and outlet valves to lower tube nest and close the bypass.

8. Line up main engine jacket water pump on isolation loop by opening bypass valve above the inlet of the pump and start pump on HAND.

9. Line up and start the boiler hot water circulating pump the supplies the heat exchanger over the evaporator. Jacket water will pass through the tubes and boiler hot water is the heat source. Line up all valves and start the boiler circulating pump by turning on the controller to "auto" and adjusting the thermostat on bulkhead above the pump. Thermostat should be set for 160 degrees for evaporator operations.

10. You should see temperature rise at the inlet and outlet sides of the lower head exchanger. There should also be a temperature drop of at least 10-15 degrees across the heat exchanger.

11. Give evaporator a few minutes to start producing distillate (5-10 minutes) then line up your fresh water valves to the tanks. (Total number of valves = 4.)

12. Start the distillate pump and turn on the salinity indicator. Evaporator should begin dumping to the bilge initially and then slowly clear within 10 minutes

Transferring water to Millipore head tank for labs.

1. Open ball valve to lab stainless steel tuning line and secure valve to ship's potable water tanks.

2. Observe the head tank in upper lab and monitor level by sight glass on the side of the tank.

3. When tank is topped off, line up water back to ship's potable water tanks and close valve to lab head tank.

Note: Always top off the Millipore head tank prior to securing the evaporator.

Securing the HJ50 Evaporator

1. Shut off salinity indicator panel and secure distillate pump.

2. Secure jacket water pump and heat source and bypass lower tube nest and break the vacuum. Let the salt-water pump fun for 15 minutes to cool the evaporator shell and tube nests.

3. Secure salt-water pump and all the valves.

4. Drain the evaporator shell, then flush and fill shell up to the view port with fresh water.