

Ethanolamines/Glycol Ethers In Plant Training (IPT)

Section Number :9
Issue Number :1.4
Origination Date :08-14-91 Author: Tim Dill
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Section Test :9

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Ethanolamines/Glycol Ethers Process Familiarization - Utilities Cooling Tower System

Answers:

1. **Explain the purpose of the cooling tower and how it works.**
To remove the heat generated by the production process. CT-500 consists of two cells and two fans. The water enters the tower on a distribution tray at the top and gravity feeds to the basin at the bottom. Air is pulled up through the tower by the fans to remove the heat of the process.
2. **State how the level is maintained in CT-500.**
By means of a control loop and process water.
3. **Explain how we temperature control the cooling tower water. Explain how the variable speed drive system works.**
The FN-500 fan has a variable frequency drive on the motor driver. If the temperature of the water increases, the fan speed increases. If the temperature of the water decreases, the fan speed decreases providing less cooling. The "B" fans operates at a constant speed.
4. **Explain the hazards that exist concerning the cooling tower during cold and freezing weather.**
During cold weather it is possible for ice to build up on the tower vanes. The added weight could collapse the tower. The ice can be kept under control by periodically melting the ice down with a deluge gun.
5. **Explain what adjustment can be made on the cooling tower to reduce the effects of freezing weather.**
The fans can be shut down to prevent heat removal. In freezing weather they are not needed and the added heat prevents ice build up.
6. **State how we can vary the amount of flow from the cooling tower to the plants.**
By shutting down one or two pump when not needed.

7. **Describe how to swap P-500's.**
A. Check all oil levels (motor and pump)
B. Open the suction valve 100%
C. Open the discharge valve 25%
D. Start the pump
E. Adjust packing gland flows
F. Open the discharge valve 100%
G. Shut down one of the other pumps
H. Block in the discharge of the off line pump
8. **State when and how the oil level is checked in the fans.**
Once a month when the safety showers are checked. The fan should be down to get an accurate reading on the dip stick. If the oil level is on the dip stick while the fan is running there is enough oil.
9. **Explain what to check on the P-500's on your normal outside round.**
A. Motor oil level (sight glasses)
B. Vibration of motor and pump
C. Oil levels in pillow bearings
D. Packing gland flush
E. Discharge pressure
F. Discharge valve 100% open
10. **State what chemicals are added to the cooling tower and what they are used for.**
A. Betz inhibitor 38K-38066
B. To control pH and calcium build up in exchangers-Sulfuric Acid
C. De-foamer to control foam
D. Chlorine to control organic growth
11. **Explain how we add Betz chemicals to the cooling tower.**
The 38K feed is controlled by a conductivity probe on the cooling water return line.
12. **Explain how we keep chemicals from building up in the water of the cooling tower.**
Daily analysis is conducted to check tower conditions. The Betz supplier checks water condition weekly and recommends adjustment if needed.
13. **State the purpose of adding chlorine to the cooling tower water.**
To control algae growth
14. **Explain how chlorine is added to the cooling tower.**
Through use of a cylinder and water ejector.
15. **Explain how to adjust the amount of chlorine going to the cooling tower.**
By adjusting the flow meter attached to the chlorine cylinder.

16. Explain what chlorine sample reading would cause you to raise the chlorine flow and what reading would cause you to lower the flow.

A reading of 1.5 would require a decreased flow rate. A reading of .5 would require an increased flow rate.

17. State what we can do about excessive foam coming from the top of the cooling tower.

The addition of a defoamer at the basin would reduce foam in the cooling tower.

Revision No. 1	06-16-93	Yearly review
Revision No. 2	06-15-94	Changed #11 from 25 ml to 6-8 ml.
Revision No. 3	01-19-95	Added D & E to #10.
	01-19-95	Added "slimicide" to the first sentence of #11.
	01-19-95	Added the second sentence to #11.
	01-19-95	Added "slimicide" to the first sentence of #12.
	01-19-95	Deleted the 2 nd and 3 rd sentence in #12
Revision No. 4	12-23-97	Yearly review