Ethanolamines/Glycol Ethers
In Plant Training (IPT)

Section Number :4B
Issue Number :1.3
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Ethanolamines - Ammonia System
P-212 A/B

Answers:

1. **Physically locate.**
   A. P-212 lube oil pressure indications.
   B. Lube oil pump start/stop station.
   C. Port 6.
   D. Buffer vent to the sump.
   E. Oil inlet to pump.
   F. Oil sight glass.
   G. Recirculation control loop.

2. **State why there is a minimum flow on a P-212 and how this is accomplished.**
   A minimum flow is required so that the pump won't be dead headed. This is accomplished by the total flow recirculation control valve.

3. **Explain what should be done in the field before starting a P-212.**
   A. Have a P-210 on line.
   B. Check with the control room.
   C. Check oil and Buffer fluid level.
   D. Start lube oil pump.
   E. Open inlet and outlet valve.
   F. Check valving on seal pot.
   G. Check valving on oil cooler.
   H. Notify control room you want to start pump.

4. **State the normal discharge pressure on the P-212's.**
   850# - 950#

5. **Explain the purpose of lube oil pumps.**
   To make sure the bearings have oil before starting pump.

6. **Explain the purpose of seal pots on the P-212's.**
   To tell us when we have a primary seal leak.

7. **State what operating conditions should be met before a P-212 is started.**
   A. P-210 running
   B. Oil pressure above shutdown pressure
   C. Recirculation control valve open at least 50%

8. **Demonstrate how to start a P-212.**
   Out in the field.

9. **Describe what two mechanical problems will shutdown a P-212.**
   Low oil pressure and high amps.

10. **State what will happen to the P-212 when the P-210 shuts down.**
    The P-212 will continue running on total recirculation. The aqua ammonia flow to the reactor will shut down.

11. **State what a normal oil level looks like.**
    Liquid level about 1/4 of sight glass with a foam level covering about another 1/2 to 2/3 of the sight glass.

12. **Describe the tandem seal arrangement on the P-212.**
    A primary and secondary seal with a buffer liquid (Royal purple 22) between the two to collect the leaking ammonia.

13. **State what indications let you know you have a product seal leak and hat indications l t you know you have an oil seal leak.**
    Product leaks will change the level and pressure on the seal pot. Oil seal leaks will be evident by oil leaking out of port 6 and by low oil levels.

14. **Explain the procedure for swapping P-212's.**
    A. Notify the control room you are ready to swap the P-212's.
    B. Make sure the suction and discharge valves are open.
    C. Check oil and Buffer level.
    D. Check valving on the oil cooler.
    E. Check valving on the seal pot.
    F. Start oil pump and check pressure.
    G. Ask boardman to go on bypass.
    H. Start pump and check discharge pressure.
    I. Shut down the other pump.
    J. Block in the discharge valve on the other pump.
    K. Notify boardman that all looks good outside.
    L Shut down auxiliary oil pump.
    M. Check for leaks and monitor oil and Buffer fluids levels.

15. **State what line-of-logic trips will shut down a P-212.**
    Low oil pressure will shut down the P-212. No other trips will shut it down.

16. **State what type of oil we use in the P-212's. State what it looks like.**
Royal purple 46.

17. **State what we use as a buffer solution. State what it looks like.**
Royal Purple 22.

Revisions:

Revision No. 1	06-09-93	Yearly Review
Revision No. 2	12-09-94	Yearly Review
Revision No. 3	12-23-97	Yearly Review