

III. OPERATING PROCEDURES (Continued)

B. Charge

1. Reactor Precharge and Vacuum Break

General Information

The reactor precharge procedure includes a series of precharge checks and precautions that must be carried out by the lead and "A" operators. If the necessary precharge conditions are not met, the Modicon (a programmable controller which controls the automatic charge sequence) will not allow the automatic charge sequence to begin. The lead operator is responsible for notifying the supervisor and having appropriate maintenance work orders written if any of the interlocks or conditions given in the procedure do not work properly.

It is the responsibility of the lead operator to see that all precharge checks and precautions are carried out. He should also read the log book at the start of the shift, covering the period since he was last on the job. This will alert him to any changes in formula, mechanical procedures, or operational procedures that may not have been passed on verbally.

Procedure

1. The lead operator will check the following during the time when the reactor is evacuating. The only exception is prepumping (step a) which preferably will be completed prior to reactor evacuation.

III. OPERATING PROCEDURES (Continued)

B. Charge (Continued)

1. Reactor Precharge and Vacuum Break (Continued)

Procedure (Continued)

1. a. If prepumping is necessary and has not been performed prior to reactor evacuation, use the following steps:

NOTE: If prepumping is necessary and has been completed prior to evacuation, the batch sheet should already have the % and counts of RVCM prepumped recorded.

- (1) Check the level in the fresh VCM receiver to make sure there is enough room to prepump. If there is not enough room and prepumping is necessary, the lead will have to stop the VCM charge from the fresh receivers when there is enough room during the reactor charge, then prepump RVCM to the receiver, then continue the charge.
- (2) Drain the receiver or receivers to be prepumped from. Open the receiver drain valve to the batch water strippers until the pressure on the stripper reaches 30 psig. The valve should automatically close at this pressure. If both receivers are to be prepumped from, drain them one at a time, not both tanks together. If both are drained at the same time there is a possibility of leaving water in one of the receivers. If water is left in the receiver, less VCM will be charged into the reactor and a "fine" batch will result.

*Prepump
steps*

III. OPERATING PROCEDURES (Continued)

B. Charge (Continued)

1. Reactor Precharge and Vacuum Break (Continued)

Procedure (Continued)

1. a. (3) Immediately after draining the receivers, put the recovered pump in automatic, open the pump discharge control valve, and start the pump from the panel.
- (4) The Modicon should cut the pump off automatically when 15% of the recovered receiver is pumped over.
The setpoint for 15% is in the Modicon on the 5385 formula. If 50% is to be prepumped, change the Modicon recipe to 5386 prior to prepumping (this will also adjust the amount of methocel for the 50% RVCM charge). The lead should monitor the prepumping to make sure it cuts off at the appropriate level.
- (5) Record on the batch sheet the actual % and counts prepumped.

NOTE: It is very important for the same amount of RVCM to be prepumped by each operator for each batch. The amount of RVCM in the reactor will affect product quality, most notably the particle size. If the amount of RVCM must be varied, contact the shift supervisor. If too much RVCM is charged, a fine batch may result and should be dumped separate if possible.

III. OPERATING PROCEDURES (Continued)

B. Charge (Continued)

1. Reactor Precharge and Vacuum Break (Continued)

Procedure (Continued)

1. b. Check the level in the fresh VCM receiver to make sure it is adequate for the charge. The level must be 75% before the charge can be made automatically. Record the level on the batch sheet.
- c. Drain the water from the recovered VCM receiver to the batch water stripper (if not prepumping RVCM). The receiver drain valve must be opened from the control panel and left open until the stripper reaches 30 psig. The valve should automatically close at this pressure. If both receivers are to be charged from, drain the tanks one at a time, not both tanks together. If both tanks are drained at the same time there is a possibility of leaving water in one of the receivers. If water is left in the receiver, less VCM will be charged into the reactor and a "fine" batch will result.
- d. Check the level and temperature in the hot water charge tank and record them on the batch sheet. The level must be 70% or more before the reactor can be charged automatically. The tank temperature should be 145°F or above. If the temperature is less than 145°F, the lead operator will check the temperature using the following procedure:

T/F

M/C

III. OPERATING PROCEDURES (Continued)

B. Charge (Continued)

1. Reactor Precharge and Vacuum Break (Continued)

Procedure (Continued)

1. d. (1) Open the reactor charge water valve and sewer valve.
- (2) Open the pump discharge valve on either A or B charge pump and turn on the corresponding pump.
- (3) Watch the charge water temperature and make sure it comes up to setpoint. If it stays below setpoint, pump the tank down until makeup water comes on and heats the tank. If the temperature stays low after the makeup water has come on, have the "A" operator check the preheater and make sure it is functioning properly. Water leaving the preheater should be 150°F.
- (4) Contact the shift supervisor if downtime is necessary due to cold charge water.
- (5) If the charge water temperature comes up to setpoint and is okay for charge, shut off the charge pump and discharge valve and close the reactor sewer valve and charge water valve.
- (6) Go back to step (d). If the tank temperature still does not show at least 145°F, proceed with the charge but monitor the water temperature carefully. Have the shift supervisor write a maintenance work order on the temperature indicator if necessary.

III. OPERATING PROCEDURES (Continued)

B. Charge (Continued)

1. Reactor Precharge and Vacuum Break (Continued)

Procedure (Continued)

1. e. The lead operator will record the before-charge methocel outage on the batch sheet. The outage must be less than 70 inches to allow enough methocel to make a charge in the small reactors and must be less than 50 inches for one charge on D-700.
- f. The lead operator will select the recipe to be charged by dialing the recipe number on the control panel recipe selector.
- g. Check and record the reactor selector switch position. If the switch is turned to large reactor, the Modicon will only let D-700 be charged. If the switch is on small reactor, D-700 cannot be charged automatically. (You will not get a charge light).
- h. The lead will set up for automatic changing by placing the charge pumps in "AUTO" as follows:
 - (1) Place the VCM transfer in "AUTO", unless you will have to prepump during or after this charge. This sets up the VCM transfer pumps at the sphere to come on automatically according to the level in the fresh VCM receiver.
 - (2) Check the position of the automatic recovered VCM charge system. Place the recovered VCM charge in "AUTO" for normal charging. If no recovered VCM is to be charged or it has been prepumped, take the

LIST

III. OPERATING PROCEDURES (Continued)

B. Charge (Continued)

1. Reactor Precharge and Vacuum Break (Continued)

Procedure (Continued)

1. h. (2) (Continued)

recovered VCM charge system out of automatic.

- (3) Place the fresh VCM charge in "AUTO" and select either the primary or spare pump for charge.

NOTE: If either VCM charge pump will not run, it should be given immediate maintenance attention.

- (4) Place the hot water charge system in "AUTO".

- (5) Place colloid charge in "AUTO".

- i. The lead operator will record the following information on the batch sheet as it is reported by the "A" operator. The lead operator must be familiar with the normal operating parameters and if any condition is abnormal, make sure the "A" operator checks it out. If the problem cannot be resolved, the lead will contact the shift supervisor.

- (1) Seal flush (DOP) level in the Dura-Seal* Unit - sight glass should normally show full (0 inches).
- (2) Seal Flush (DOP) Pressure - normally 220-240 psig (or 195 psig if on HPSW rather than DOP).
- (3) Seal Flush (DOP) Flow - normally 1-2 gpm or 50% which is 2 gpm.
- (4) Seal Flush (DOP) Return Temperature -
- (5) Seal Flush (DOP) Filter ΔP -

III. OPERATING PROCEDURES (Continued)

B. Charge (Continued)

1. Reactor Precharge and Vacuum Break (Continued)

Procedure (Continued)

1. i. (6) Lip seal flow - normally 40%, which is 2 gpm.
 - (7) Agitator oil flow (for D-300 and D-400 only) - Normally 50% which is 1/4 gpm.
 - (8) Agitator oil pressure (for D-300 and D-400 only)- Normally 10-25 psig.
 - (9) The following readings will be reported on the AMS kill system:
 - (a) AMS pot pressure - should be 300 psig.
 - (b) AMS pot level - should be 5-6 inches outage. FIB
 - (c) Valve nitrogen pressure - must be at least 600 psig.
 - (d) Pot nitrogen pressure - must be at least 1200 psig.
 - (10) Rinse flush flow - Normally 50% which is 1/4 gpm.
2. During evacuation, the reactor "A" operator will make the following precharge checks on the way to the top of the reactor to check vacuum.
 - a. Check the catalyst freezer to make sure there is enough of the proper type of catalyst for charging.
 - b. Check the Dura-Seal* unit level and report it to the lead operator. The sight glass should show full.

If it shows less than full, the reactor seal may be leaking and the following steps should be taken:

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III. OPERATING PROCEDURES (Continued)

B. Charge (Continued)

1. Reactor Precharge and Vacuum Break (Continued)

Procedure (Continued)

2. b. (Continued)

- (1) Measure the outage from the top of the sight glass and report that outage to the lead operator.
- (2) Fill the reservoir back to full with DOP by opening the make up valve to the Dura-Seal* Unit and then opening the valve at the DOP makeup tank. When the level is replenished, close both valves.
- (3) Check the seal for leakage by closing the return valve that comes back from the agitator seal to the DOP unit. (the valve going to the seal will have a car-seal on it which is only to be removed by the shift supervisor or chief lead). With the valve closed, the seal oil pressure should remain stable and the flow should be zero. If flow is shown with the return valve closed, contact the lead operator and shift supervisor that the seal is leaking and do not charge the reactor unless the supervisor's approval is given.
- (4) If the seal holds, re-open the return valve and monitor the Dura-Seal unit for further leakage. If leakage is persistent, contact the shift supervisor and he or the chief lead can check the seal (by closing the DOP supply and return valves momentarily and

III. OPERATING PROCEDURES (Continued)

B. Charge (Continued)

1. Reactor Precharge and Vacuum Break (Continued)

Procedure (Continued)

2. b. (4) (Continued)

monitoring the seal pressure.

- c. Check the seal flush (DOP) pressure and report it to the lead operator. It should run 220-240 psig (or about 200 psig if on HPSW rather than DOP).
- d. Check the seal flush (DOP) flow and report it to the lead operator. It should be 1-2 gpm or 50% which is 2 gpm.
- e. Check the seal flush (DOP) return temperature and report it to the lead operator. It should run °F.
- f. Check the seal flush (DOP) filter P and report it to the lead operator. It should normally be less than psig.
- g. Check the reactor lip seal flow and report it to the lead operator. It should be 40% which is 2 gpm.
- h. Check the agitator oil flow (for D-300 and D-400 only) and report it to the lead operator. It should show 50% which is $\frac{1}{4}$ gpm.
- i. Check the agitator oil pressure (for D-300 and D-400 only) and report it to the lead operator. It should be 10-25 psig.
- j. Check the following on the AMS Kill System and report to the lead operator:
 - (1) AMS pot pressure - should be 300 psig.
 - (2) AMS pot level - outage should be 5-6 inches.
 - (3) Valve nitrogen pressure - must be at least 600 psig.
 - (4) Pot nitrogen pressure - must be at least 1200 psig.
- k. Check the rinse flush flow and report it to the lead operator. It should be 50% which is $\frac{1}{4}$ gpm.

III. OPERATING PROCEDURES (Continued)

B. Charge (Continued)

1. Reactor Precharge and Vacuum Break (Continued)

Procedure (Continued)

3. When the evacuation and precharge checks are complete, the lead operator will move the interlock mode selector to "charge" if this was not done at the end of evacuation (Section III, A-13). All reactor valves except the jacket steam valve should be closed.
4. The lead operator will push the meter reset and enter button. These must be pushed at the same time to get a charge light.
5. The automatic charge light will come on if the following conditions are met:
 - a. The fresh VCM receiver has a 70% level.
 - b. The hot water tank has a 70% level.
 - c. The reactor selector switch is in the correct position according to the reactor in the charge mode.
 - d. Only one reactor is in the charge mode.
 - e. The meter reset and enter button are pushed together as described in step 4.
6. The lead operator will open the reactor charge valve (main dump valve) and then both reactor VCM charge valves from the control panel to break vacuum. The turbine meters will start counting as VCM flows into the reactor.
7. The lead operator will check for pressure on the reactor by watching the pressure indicator pen and will close the "A" VCM charge valve when positive pressure is indicated on the reactor.

List

T/F

III. OPERATING PROCEDURES (Continued)

B. Charge (Continued)

Procedure (Continued)

8. The "A" operator will watch the reactor pressure gauge at the top of the reactor (and will replace any faulty gauges). He will also listen for the vacuum to be broken and make sure the normal "whoosing" sound is heard. If not or if the reactor begins to vibrate badly when vacuum is broken, the "A" will inform the lead operator. This could indicate that the reactor was not completely empty and it may have to be recovered, drained and re-evacuated.
9. After vacuum is broken, the "A" operator will visually check the reactor manhead by listening for escaping vapors and feeling around it with his bare hand to check for leaks. If a leak is detected, the reactor must be recovered, the "O" ring must be replaced, and the reactor must be re-evacuated.
10. The "A" operator will check all the reactor safety disc pressure gauges for pressure. Any pressure indicates a leaking or ruptured disc. If this condition is observed, the reactor cannot be charged until the disk is changed out. The "A" operator is responsible for replacing any defective pressure gauges on the discs.
11. If all the discs are okay the "A" will notify the lead operator that "All the discs are okay" and the lead will initial the batch sheet accordingly.