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Task Scope SWITCHING MODES AND  
ANALYSIS FOR TAKING  
OTSG "R" SOLID

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Reason felt task is complete:

OPTIONS DEFINED, SYSTEMS ANALYZED  
AND RECOMMENDATIONS COMPLETED  
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## SWITCHING MODES AND ANALYSIS FOR TAKING OTSG "B" SOLID

The following concerns should be addressed by the TMI operating personnel when attempting to take the "B" OTSG loop solid. These recommendations attempt to minimize the RCS system perturbation.

- I. During both the feedwater line fill and initial operation of the "B" OTSG in the solid flow mode, the feedwater should be heated.
  - A. Fill of the OTSG with the long term O.T.S.G. cooldown system available.
    - 1) The temperature of the feedwater should be heated to match the RCS.  $T_C$  "B" loop prior to filling the OTSG using the 13th stage feedwater heater or other available heat source. This will minimize the perturbation of the temperature profile in the OTSG with using the existing feedwater system hardware. A preferable alternative is to fill the OTSG thru the emergency OTSG feedwater piping nozzle preheated to between the RCS  $T_1$  and  $T_2$  on the "B" OTSG loop, but we understand such capability does not exist with the present feedwater system hardware.
    - 2) The main feedwater piping should be preheated by setting up a loop between the condenser, condensate pump, 13th stage FW heater (or other heat source), and FW piping up to the main FW containment isolation valves. This will minimize the cold slug of water being injected into the "B" OTSG during the fill operation.
    - 3) The air bleed operation of the feedwater piping should be performed carefully in order to minimize pushing air pockets, and consequently non-condensibles into the "B" OTSG.
    - 4) The filling operation should be taken in stages - 10% of the fill should be entered slowly in each stage. Between the RCS system flow, pressure, temperature parameters should be allowed to reach equilibrium. If the disruption evident from any stage is substantial ( $\pm 30F T_A$ ), the steps should be taken slower.
    - 5) The transfer from using the 10" turbine bypass line to using the long term OTSG cooldown system should be performed by simultaneously opening the main steam isolation valve and closing the 10" turbine bypass valve. This will minimize the flow perturbation when switching from operating solid using the turbine bypass to the long term OTSG cooldown system.

- 6) Prior to switching to the long term OTSG cooling system, the system should be filled with water heated to the current B secondary temp and air bled. It is strongly recommended that a drain line to the condenser be provided on the long term OTSG cooling system for initial system fill/heat-up operation and later required maintenance operations.
- 7) It is strongly recommended that the long term cooling system pumps be provided with double mechanical seal stuffing boxes to ensure that pump process fluid leakage is eliminated.
- 8) Recommend that a "flush" system to LWS or other appropriate location be provided to provide a means of flushing and working on the system after the expected contamination.
- 9) It is strongly recommended that a fill connection on the long term cooling system surge tank be provided from the condensate tank or demineralized water system.
- 10) The long term OTSG cooling system heat exchanger should be bypassed when the switch is made from the condensate pump to the long term cooling system. The temperature in the heat exchanger should be raised to match  $T_c$  in the RCS "B" loop prior to opening the bypass valves. The temperature in the OTSG when reduced should be reduced only at a very slow rate ( $2^\circ\text{F}/\text{hr.}$ ) using the long term OTSG cooling system so as to minimize the RCS system thermohydraulic perturbations.

B. Fill of the OTSG without the long term OTSG cooldown system available.

- 1) Feedwater should be heated to match the RCS  $T_c$  in the "B" loop prior to filling the OTSG. A preferable alternative is to fill the OTSG thru the emergency feedwater piping nozzle preheated to between the RCS  $T_c$  and  $T_h$  on the "B" OTSG loop. The same rate cautions and scheme indicated in A 4 should be followed to minimize upset of the current circulation mode.
- 2) Condenser vacuum should be maintained until after the feedwater/steam line piping is filled in order to prevent perturbing the RCS parameters and raising the thermocouple temperatures.
- 3) The turbine gland seal system should be maintained by using the auxiliary steam supply (i.e. valve MS-V19 open and valve MS-V17).
- 4) Same as items A2 and A3 above.