

CAUSE DESCRIPTION AND CORRECTIVE ACTION

(Attachment to LER 50-368/80-018/03L-1)

The unit tripped from approximately 100% full power due to a loss of offsite power and 100% load rejection. Both emergency diesel generators came on automatically. The reactor established natural circulation with both emergency feedwater pumps (2P7A and 2P7B) automatically feeding the steam generators. The emergency feedwater pumps were using a common suction from the condensate storage tanks and the startup and blowdown demineralizer effluent. Approximately 15 minutes after the initial loss of off-site power, flow became erratic with flow rate oscillating approximately 20% (between 80% and 100% of rated flow). This indicated that cavitation was occurring in the EFW pumps. The source of the problem was determined to be the EFW suction from the startup and blowdown demineralizers and the operators isolated this source of EFW suction.

Since adequate steam generator level existed to allow natural circulation cooling and S/G levels were above the EFAS setpoint, EFW pumps 2P7A and 2P7B were stopped and vented. These venting operations were performed in series such that EFW flow was never interrupted. There was no complete loss of EFW suction during this event and no automatic switchover to service water suction occurred.

The cause of the cavitation (termed a loss of suction in Revision 0 of this report) was determined to be flashing of the effluent of the startup and blowdown demineralizers, which along with the condensate storage tank, was providing a common suction to the EFW pumps. A possible explanation was considered to be that loss of auxiliary cooling water to the steam generator blowdown heat exchangers might have caused the demineralizer effluent to heat up to the point of flashing. However, a more likely cause appears to be that reported in Revision 0 of this report: Heating of the feedwater train without forced flow allowed hot water to drain back through to the condensate pump discharge line which is also connected to the startup and blowdown demineralizer inlets. This hot water was flashing to steam and passed through the demineralizers and on to the EFW pumps suction. In either case, the corrective action is the same. That is, to isolate the startup and blowdown demineralizer effluent from the EFW suction. The plant startup and emergency feedwater operating procedures have been modified to require isolation prior to exceeding 5% power. In addition, these valves are checked shut once per shift and documented on the shift turnover checklist. This administrative control is believed to be adequate to prevent recurrence.