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HPSW Pump Requirements to Support LPSW
16.9.8

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>A. Jockey pump unable to maintain EWST level.</p> <p><u>OR</u></p> <p>Jockey pump unable to fill EWST.</p>	<p>A.1 Declare Jockey Pump inoperable.</p>	<p>Immediately</p>
<p>B. One required HPSW pump inoperable.</p> <p><u>AND</u></p> <p>-----NOTE----- Unit 2 ECCW cannot supply both Units 1 & 2 LPSW pumps and Unit 3 LPSW pumps simultaneously. -----</p> <p>Required LPSW pump not supplied by Unit 2 ECCW per ITS 3.7.8.</p>	<p>B.1 Declare required LPSW pump not supplied by Unit 2 ECCW inoperable.</p>	<p>Immediately</p>

HPSW Pump Requirements to Support LPSW
16.9.8

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>C. One Unit 1 Main Feeder Bus inoperable.</p> <p><u>AND</u></p> <p>-----NOTE----- Unit 2 ECCW cannot supply both Units 1 & 2 LPSW pumps and Unit 3 LPSW pumps simultaneously. -----</p> <p>Required LPSW pump not supplied from Unit 2 ECCW per ITS 3.7.8.</p>	<p>C.1 Declare affected LPSW pump inoperable.</p>	<p>Immediately</p>
<p>D. Two required HPSW pumps inoperable.</p> <p><u>AND</u></p> <p>-----NOTE----- Unit 2 ECCW cannot supply both Units 1 & 2 LPSW pumps and Unit 3 LPSW pumps simultaneously. -----</p> <p>LPSW pumps not supplied from Unit 2 ECCW per ITS 3.7.8.</p>	<p>D.1 Enter ITS LCO 3.0.3.</p>	<p>Immediately</p>

HPSW Pump Requirements to Support LPSW
16.9.8

The HPSW system must provide upper guide bearing sealing and motor cooling to the Unit 1 CCW Pumps to ensure the CCW system can provide a suction supply to the LPSW system. This is required to provide sealing water for CCW Pump shafts to prevent loss of siphon flow and to provide cooling for the CCW Pump(s) after restart of the CCW Pump(s) for Units 1 and 3. Sealing is required any time the CCW system is in the siphon flow mode of operation. Cooling to the CCW Pump motors is required any time the CCW Pumps are required to operate. The Unit 2 and Unit 3 CCW pumps no longer rely upon the HPSW system for these functions, since the Siphon Seal Water (SSW) System, supplied from the LPSW system, fulfills these functions. Under some conditions, the Unit 2 ECCW System can supply adequate suction supply to the LPSW pumps for either Units 1 and 2 or Unit 3 per ITS 3.7.8. Therefore, the action statements for SLC 16.9.8 allow credit for the Unit 2 CCW supply to the LPSW system if ITS 3.7.8 requirements are met.

At certain lake levels unassisted gravity flow may be possible. If so, the EWST is not required to support siphon flow by providing sealing of the CCW Pump Upper Guide Bearing to prevent some of the air in-leakage that could defeat the ECCW siphon. However, HPSW is still required to support operation of the Unit 1 and Unit 3 CCW Pumps since procedures require that the Unit 1 CCW pumps must be restarted following a LOCA/LOOP.

LPSW takes suction from the CCW crossover header. During certain analyzed accident conditions, a loss of power to the CCW Pumps for all three units must be assumed. This results in a loss of forced flow to the CCW crossover header. Initially, the sealing requirements for Unit 3 are met via the EWST. The duration of the event may last beyond the capability of the inventory of the EWST. Therefore the HPSW Pumps must be capable of being started following a loss of power in order to meet the cooling and seal lubrication requirements of the Unit 1 CCW Pumps.

The HPSW Jockey Pump is supplied by "load shed" power and would not be available until after the load shed is reset. The CCW Design Basis Document (Section 20.1.1.3) requires a restart of a CCW Pump (for Unit 1) within one and one-half hours (for Unit 1). The load shed must be reset to restart the CCW pump (for Unit 1), thus the power would also be available to the Jockey Pump within that time frame. The Jockey Pump is of smaller capacity, would not meet fire protection capacity requirements, and would take longer to refill the EWST. Therefore, the Jockey Pump is considered as a substitute for an HPSW Pump only for purposes of supporting the siphon or the restart of a Unit 1 CCW Pump and not for Fire Protection.

The HPSW Jockey Pump is of smaller capacity than HPSW Pumps A and B. Calculation OSC-5945, "HPSW Pump and Fire Protection Flow Test Acceptance Criteria" calculates the accident loads and concludes the HPSW Jockey Pump has sufficient capacity to supply those loads plus system leakage provided it is able to maintain the EWST level or fill the EWST in normal usage. Accident loads plus system leakage are calculated to be approximately the same as normal loads plus normal system leakage.

All three HPSW pumps are powered from the Unit 1 Main Feeder Busses. Backup power to the Unit 1 Main Feeder Busses is not available from another unit.

Therefore, if one of the two available Unit 1 Main Feeder Busses is removed from service, then the remaining HPSW pumps are vulnerable to a single failure of the other Unit 1 Main Feeder Bus. This would also result in LPSW not being single failure proof since HPSW is necessary for LPSW operation in the conditions described above.

An EWST level of 70,000 gallons is chosen as the minimum level for EWST operability since this is the lowest level which would exist during normal daily operation. An EWST level of 70,000 gallons is the setpoint at which an HPSW pump in "base" would start to make up to the EWST. This situation would not be expected to occur during normal system operation since the HPSW Jockey pump is capable of maintaining EWST level at 100,000 gallons. The EWST is considered out of service if HPSW-25 is out of service or if in any way water cannot be supplied from the EWST via the sealing water path to CCW Pumps or if EWST level cannot be maintained > 70,000 gallons.

REFERENCES:

1. OSC-5409, Rev. 3, "Single Failure Analysis of the ECCW System Supply to the LPSW System".
2. OSC-5349, Rev. 1, "Minimum Lake Level Required to Maintain Sufficient NPSH to the LPSW Pumps via Gravity Flow".
3. OSC-5945, Rev. 0, "HPSW Pump and Fire Protection Test Acceptance Criteria".
4. PIP 0-094-0952
5. PIP 0-094-0995
6. PIP 0-095-0307
7. PIP 0-095-0174
8. Oconee UFSAR Sections 9.2.2, 9.5.1, 15.0, Table 9-4, Figure 9-9 through 9-12; 12/31/96 update.
9. Selected Licensee Commitments 16.9.1, 16.9.7, as amended.
10. OSS-0254.00-00-1002, Rev. 7, "Design Basis Specification for HPSW".
11. OSS-0254.00-00-1039, Rev. 10, "Design Basis Specification for LPSW".
12. OSS-0254.00-00-1003, Rev. 8, "Design Basis Specification for CCW".
13. Letter dated 4/20/94 from J. W. Hampton (Duke) to NRC regarding supplemental information for revision to Tech. Spec. 3.4.