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16.9 AUXILIARY SYSTEMS

16.9.12 Additional Low Pressure Service Water (LPSW) System OPERABILITY Requirements

COMMITMENT The following LPSW System Structures, Systems and Components (SSCs) shall be OPERABLE:

- a. LPSW-4 ("A" LPI COOLER SHELL OUTLET)
- b. LPSW-5 ("B" LPI COOLER SHELL OUTLET)
- c. LPSW-139 (LPSW SUPPLY TO TB NON-ESSENTIAL HDR)
- d. LPSW Pump Minimum Flow Recirculation Lines

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. LPSW flowpath through an LPI cooler isolated by a manual valve.	A.1 Declare associated LPI train inoperable.	Immediately
B. LPSW-4 inoperable and closed.  <u>OR</u> LPSW-5 inoperable and closed.	B.1 Declare associated LPI train inoperable.	Immediately

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CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>C. LPSW flowpath through an LPI cooler not isolated by manual valve.</p> <p><u>AND</u></p> <p>LPSW-4 inoperable and not closed.</p> <p><u>OR</u></p> <p>LPSW-5 inoperable and not closed.</p>	<p>C.1 Enter applicable Condition of ITS 3.7.7 for 1 required LPSW pump inoperable.</p>	<p>Immediately</p>
<p>D. One required LPSW pump minimum recirculation line inoperable.</p>	<p>D.1 Enter applicable Condition of ITS 3.7.7 for one required LPSW pump inoperable.</p>	<p>Immediately</p>
<p>E. Two or more Unit 1 and 2 LPSW pump minimum recirculation lines inoperable when three LPSW pumps are required to be OPERABLE by ITS 3.7.7.</p>	<p>E.1 Enter ITS LCO 3.0.3.</p>	<p>Immediately</p>
<p>F. LPSW-139 inoperable.</p>	<p>-----NOTE----- Required Action is applicable to each ONS Unit supplied by associated LPSW System. -----</p> <p>F.1 Enter applicable Condition of ITS 3.7.7 for one required LPSW pump inoperable.</p>	<p>Immediately</p>

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CONDITION	REQUIRED ACTION	COMPLETION TIME
G. LPSW-139 inoperable on Unit 1.  <u>AND</u>  LPSW-139 inoperable on Unit 2.	G.1 Enter ITS LCO 3.0.3 for ONS Unit 1 and ONS Unit 2.	Immediately

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**SURVEILLANCE REQUIREMENTS**

SURVEILLANCE	FREQUENCY
SR 16.9.12.1 Test LPSW-4, LPSW-5 and LPSW-139 in accordance with the Inservice testing Program.	In accordance with the Inservice Testing Program
SR 16.9.12.2 Test LPSW pump minimum recirculation lines.	18 months

**BACKGROUND**

The Low Pressure Service Water (LPSW) System provides cooling water for normal and emergency services throughout the station. Safety related functions served by this system include the Reactor Building cooling units (RBCUs), Low Pressure Injection (LPI) coolers, and coolers for the High Pressure Injection (HPI) and Emergency Feedwater (EFW) motors.

**APPLICABLE SAFETY ANALYSES**

Sufficient LPSW System flow is required to meet the acceptance criteria of containment heat removal safety analyses.

**COMMITMENT (S)**

The following Low Pressure Service Water System SSC's shall be OPERABLE:

- a. LPSW-4 ("A" LPI COOLER SHELL OUTLET)
- b. LPSW-5 ("B" LPI COOLER SHELL OUTLET)
- c. LPSW-139 (LPSW SUPPLY TO TB NON-ESSENTIAL HDR)
- d. LPSW Pump Minimum Flow Recirculation Lines

## APPLICABILITY

This SLC applies in MODES 1, 2, 3, and 4. This applicability is consistent with the LPSW System operability requirements in Technical Specification 3.7.7. In MODES 5 and 6 the OPERABILITY requirements of the LPSW System are determined by the system it supports.

## ACTIONS

### A.1, B.1, C.1

During normal operation, LPSW flow is isolated to the LPI coolers with block valves LPSW-4 and LPSW-5 in the closed position. If a LOCA occurs, LPSW-4 and LPSW-5 are required to be opened after Reactor Building Emergency Sump (RBES) recirculation is established. LPSW-251 and LPSW-252, for Units 1 and 2, and LPSW-404, and LPSW-405 for Unit 3 are the normal LPI cooler flow control valves and are normally in AUTO at a setpoint of 3,000 gpm. If a LOCA occurs, Instrument Air (IA) and Auxiliary Instrument Air (AIA) are assumed unavailable since they are not safety related. With LPSW-251 and LPSW-252, for Units 1 and 2, and LPSW-404 and LPSW-405, for Unit 3, failed open and unavailable, LPSW-4 and LPSW-5 are credited for throttling LPI cooler shell side flow to maintain sufficient LPSW pump NPSH and adequate LPSW flow to the safety related loads. Therefore, as defined in this SLC, LPSW-4 and LPSW-5 operability is met by having the capability to throttle these valves from the control room.

If the LPSW flowpath through an LPI cooler is isolated due to a manual valve, then LPSW pump NPSH and LPSW flow to the other safety related loads would still be adequate. However, the LPSW flow to the affected LPI cooler would not be adequate. Thus, if the LPSW flowpath through an LPI cooler is isolated due to a manual valve, then the affected LPI train shall be declared inoperable.

If LPSW-4 or LPSW-5 is closed and not capable of throttling LPSW flow, then LPSW pump NPSH and LPSW flow to the other safety related loads would still be adequate. However, the LPSW flow to the affected LPI cooler would not be adequate. Thus, if LPSW-4 or LPSW-5 is closed and does not have throttle capability, then the affected LPI train shall be declared inoperable.

If one or both LPSW-4 and LPSW-5 are not closed but not capable of throttling LPSW flow, then LPSW pump NPSH and LPSW flow to the safety related loads may be inadequate. If a single failure of an LPSW pump is not assumed, then sufficient LPSW pump NPSH and LPSW flow to the safety related loads does exist. Thus, if one or both LPSW-4 and LPSW-5 are not closed and do not have throttle capability, then the LPSW system cannot withstand a single failure and the affected unit(s) shall enter the applicable Condition of ITS 3.7.7 for

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one required LPSW pump inoperable. For Units 1 & 2, both units would be affected if a valve on either unit is inoperable.

D.1, E.1

NSM ON-1,2,33001 removed LPSW-4 and LPSW-5 from ES actuation. By maintaining isolation of LPSW flow to the LPI Coolers during the initial phase of a LOCA, the potential exists for the LPSW pumps to be operated below the manufacturer's recommended minimum continuous flow rate of 4,250 gpm per pump. If all LPSW pumps successfully start and operate during the event, the potential exists for a stronger pump to deadhead a weaker pump during low flow conditions. To avoid damaging a pump due to minimum flow concerns, minimum flow recirculation piping exists for each LPSW pump. The minimum flow recirculation lines ensure the operability of a deadheaded pump until LPSW-4 or LPSW-5 are open on the LOCA unit after RBES recirculation is established. If an LPSW pump's minimum flow recirculation line is inoperable, the LPSW system is not single failure proof and the associated unit shall enter the applicable Condition of ITS 3.7.7 for one required LPSW pump inoperable. If both Unit 3 LPSW pump minimum flow recirculation lines are inoperable, the 72 hour ITS Completion Time is still appropriate because the stronger pump will always have sufficient flow. Likewise, if the Unit 1&2 LPSW system is in a condition that only requires two OPERABLE LPSW pumps per ITS 3.7.7, the minimum flow recirculation lines associated with both OPERABLE pumps may be simultaneously inoperable for a duration of 72 hours permitted by ITS LCO 3.7.7. If the Unit 1&2 LPSW system is in a condition that requires three OPERABLE LPSW pumps per ITS 3.7.7 and two or more minimum flow recirculation lines are out of service, both Unit 1 and Unit 2 shall enter ITS LCO 3.0.3.

F.1, G.1, H.1, I.1

During normal operation, valve LPSW-139 is open to supply LPSW flow to the Main Turbine Oil Tank (MTOT) and other various non-essential loads on the applicable unit. In the event of a LOCA, LPSW-139 is credited to close after RBES Recirculation is established, but prior to opening valves LPSW-4 and LPSW-5. Since the Unit 1&2 LPSW system is shared, both LPSW-139 for Unit 1 and LPSW-139 for Unit 2 shall be closed if the non-LOCA unit has tripped due to a concurrent LOOP. Closing LPSW-139 maintains sufficient LPSW pump NPSH and adequate LPSW flow to the safety related loads. Remote closure capability for LPSW-139 shall exist from the control room. If LPSW-139 is not capable of closing, and a single failure of an LPSW pump occurs, LPSW pump NPSH and LPSW flow to the safety related loads may be inadequate. If LPSW-139 for Unit 1 or LPSW-139 for Unit 2 is closed or isolated by system block valves for maintenance, then the valve is still considered operable. Thus, if LPSW-139 is not capable of closing, the associated unit shall enter the applicable Condition of ITS 3.7.7 for one required LPSW pump inoperable. Since the Unit 1&2 LPSW system is shared and LPSW-139 for Units 1 and 2 are normally open, the 72 hour Completion Time applies to both Unit 1 and Unit 2 if LPSW-139 for Unit 1 or LPSW-139 for Unit 2 is inoperable. If both 1LPSW-139 and 2LPSW-139

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are inoperable, sufficient LPSW pump NPSH and LPSW flow to the safety related loads may not be available, even without a single failure. This scenario requires both Unit 1 and Unit 2 to enter ITS LCO 3.0.3.

**SURVEILLANCE REQUIREMENTS**

SR 16.9.12.1

This SR requires that LPSW-4, LPSW-5, and LPSW-139 be tested per Oconee's ASME Section XI IST Program. Testing under this program is adequate to assure operability of these valves.

SR 16.9.12.2

This SR requires that the LPSW pump minimum recirculation lines be tested every 18 months. An 18 month frequency is adequate to ensure significant degradation has not occurred due to service water related fouling.

**REFERENCES**

1. OSS-0254.00-00-1039, Design Basis Specification for the Low Pressure Service Water System, rev. 10.
2. OSC-2280, LPSW Pump NPSH and Minimum Required Lake Level, rev. 10.
3. OSC-4672, Unit 1&2 LPSW System Response to a Large Break LOCA Using a Benchmarked Computer Hydraulic Model, rev. 7.
4. OSC-4489, Predicted Unit 3 LPSW System Response to a Large Break LOCA Using a Benchmarked Computer Hydraulic Model, rev. 5.
5. PT/1/A/0251/023, LPSW System Flow Test, performed on 11/16/97.
6. PT/2/A/0251/023, LPSW System Flow Test, performed on 4/20/96.
7. PT/3/A/0251/023, LPSW System Flow Test, performed on 1/19/97.
8. PT/1,3/A/0251/01, LPSW Pump Test.
9. ITS 3.5.3 and 3.7.7.
10. Oconee UFSAR Section 9.2.2, 12/31/96 update.
11. Letter from J. W. Hampton, (DPC), to USNRC, dated June 6, 1996, Proposed Technical Specification amendment for LPSW-4, -5.
12. NRC Safety Evaluation Report, dated August 19, 1996, Technical Specification Amendment 217/217/214.