

**3.7 PLANT SYSTEMS**

**3.7.9 Ultimate Heat Sink (UHS)**

**LCO 3.7.9**      The UHS shall be OPERABLE. With ambient wet-bulb temperature > 63°F, four fans and four spray cells per train shall be OPERABLE. With ambient wet-bulb temperature ≤ 63°F, three fans and four spray cells per train shall be OPERABLE.

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

**ACTIONS**

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p><b>A.</b> One or more Nuclear Service Cooling Water (NSCW) basins with water temperature and/or water level not within limits.</p>	<p><b>A.1</b>      Restore water temperature(s) and water level(s) to within limits.</p>	<p>72 hours</p>
<p><b>B.</b> One NSCW cooling tower with one or more required fans and/or spray cells Inoperable.</p>	<p><b>B.1</b>      Restore fan(s) and spray cell(s) to OPERABLE status.</p>	<p>72 hours</p>

(continued)

**SURVEILLANCE REQUIREMENTS**

<b>SURVEILLANCE</b>		<b>FREQUENCY</b>
SR 3.7.9.1	Verify water level of NSCW basin is $\geq 80.25$ ft.	24 hours
SR 3.7.9.2	Verify water temperature of NSCW basin is $\leq 90^{\circ}\text{F}$ .	24 hours
SR 3.7.9.3	Operate each required NSCW cooling tower fan for $\geq 15$ minutes.	31 days
SR 3.7.9.4	Verify NSCW basin transfer pump operation.	In accordance with the Inservice Testing Program
SR 3.7.9.5	Verify ambient wet-bulb temperature $\leq 63^{\circ}\text{F}$ when one NSCW tower fan is out-of-service and daily high temperature (dry-bulb) is forecasted to be $> 48^{\circ}\text{F}$ .	24 hours

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**BASES**

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**APPLICABLE  
SAFETY ANALYSES  
(continued)**

The operating limits are based on conservative heat transfer analyses for the worst case LOCA. Reference 1 provides the details of the assumptions used in the analysis, which include worst expected meteorological conditions, conservative uncertainties when calculating decay heat, and worst case single active failure (e.g., single failure of a manmade structure). The UHS is designed in accordance with Regulatory Guide 1.27 (Ref. 2), which requires a 30 day supply of cooling water in the UHS.

The UHS satisfies Criterion 3 of 10 CFR 50.36 (c)(2)(ii).

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**LCO**

The UHS is required to be OPERABLE and is considered OPERABLE if it contains a sufficient volume of water at or below the maximum temperature that would allow the NSCW to operate for at least 30 days following the design basis LOCA without the loss of net positive suction head (NPSH), and without exceeding the maximum design temperature of the equipment served by the NSCW.

In order to meet these requirements, two NSCW tower basins are required OPERABLE with the following:

1. Basin water level must be  $\geq 80.25$  feet as measured from the bottom of the basin (73% of instrument span),
  2. Basin water temperature must be  $\leq 90^{\circ}\text{F}$ ,
  3. Two OPERABLE trains of NSCW tower fans, each train consisting of four fans and four spray cells when ambient wet-bulb temperature  $> 63^{\circ}\text{F}$  or three fans and four spray cells (sprays and natural draft through the nonoperating fan) when ambient wet-bulb temperature  $\leq 63^{\circ}\text{F}$ , and
  4. Two OPERABLE NSCW basin transfer pumps.
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**APPLICABILITY**

In MODES 1, 2, 3, and 4, the UHS is required to support the OPERABILITY of the equipment serviced by the UHS and required to be OPERABLE in these MODES.

In MODE 5 or 6, the OPERABILITY requirements of the UHS are determined by the systems it supports.

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(continued)

**BASES**

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**ACTIONS**  
(continued)

**D.1 and D.2**

If the Required Actions of Conditions A, B, or C are not completed within their associated Completion Times or if the UHS is inoperable for reasons other than described in Conditions A, B, or C, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 in 6 hours and in MODE 5 within 36 hours.

The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

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**SURVEILLANCE**  
**REQUIREMENTS**

**SR 3.7.9.1**

This SR verifies that adequate long term (30 day) cooling can be maintained. The specified level also ensures that sufficient NPSH is available to operate the NSCW System pumps. The 24 hour Frequency is based on operating experience related to trending of the parameter variations during the applicable MODES. This SR verifies that the UHS water level is  $\geq 80.25$  feet (plant elevation of 217 feet-3 inches or 73% of Instrument span on LI-1606 and LI-1607).

**SR 3.7.9.2**

This SR verifies that the NSCW System is available to cool the CCW System to at least its maximum design temperature with the maximum accident or normal design heat loads for 30 days following a Design Basis Accident. The 24 hour Frequency is based on operating experience related to trending of the parameter variations during the applicable MODES. This SR verifies that the water temperature of the UHS is  $\leq 90^{\circ}\text{F}$  (TJI-1690 and TJI-1691).

**SR 3.7.9.3**

Operating each required NSCW cooling tower fan for  $\geq 15$  minutes ensures that all required fans are OPERABLE and that all associated controls are functioning properly.

(continued)

**BASES**

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**SURVEILLANCE  
REQUIREMENTS**

**SR 3.7.9.3** (continued)

It also ensures that fan or motor failure, or excessive vibration, can be detected for corrective action. The 31 day Frequency is based on operating experience, the known reliability of the fan units, the redundancy available, and the low probability of significant degradation of the UHS cooling tower fans occurring between surveillances.

**SR 3.7.9.4**

The verification of NSCW basin transfer pump operation includes testing to verify the pump's developed head at the flow test point is greater than or equal to the required developed head. Flow and differential head are normal tests of centrifugal pump performance required by Section XI of the ASME Code (Ref. 3). This test confirms one point on the pumps design curve and is indicative of overall performance. Such inservice tests confirm component OPERABILITY, trend performance, and detect incipient failures by indicating abnormal performance. The performance of this surveillance in accordance with the Inservice Testing Program satisfies the requirements of Ref. 3.

**SR 3.7.9.5**

With one tower fan out-of-service this SR verifies that ambient wet-bulb temperature remains  $\leq 63^{\circ}\text{F}$  so that the NSCW system remains capable of performing its design basis function. Requiring this SR when forecasted temperature is  $> 48^{\circ}\text{F}$  provides assurance that the ambient wet-bulb temperature of  $63^{\circ}\text{F}$  will not be exceeded while the fan is out-of-service. The 24-hour frequency is sufficient since the daily peak temperature is expected to occur once in a 24-hour interval. Measurement of the ambient wet-bulb temperature should be made near the time when the daily peak temperature is expected to occur with a psychrometer in an open area, away from sources of moisture, heat or wind, and within the owner-controlled area at Plant Vogtle.

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**REFERENCES**

1. FSAR, Subsection 9.2.5.
2. Regulatory Guide 1.27.
3. ASME, Boiler and Pressure Vessel Code, Section XI.