

Facility Operating License NPF-86
Docket No. 50-443

License Amendment Request No. 93-02
Service Water System/Ultimate Heat Sink
OPERABILITY Requirements

This License Amendment Request is submitted by North Atlantic Energy Service Corporation pursuant to 10CFR50.90. The following information is enclosed in support of this License Amendment Request:

- Section I - Introduction and Description of Proposed Changes
- Section II - Markup of Proposed Changes
- Section III - Retype of Proposed Changes
- Section IV - Safety Evaluation of Proposed Changes
- Section V - Determination of Significant Hazards for Proposed Changes
- Section VI - Proposed Schedule for License Amendment Issuance and Effectiveness
- Section VII - Environmental Impact Assessment
- Section VIII - Other Supporting Information

Sworn and Subscribed
to before me this

7th day of April, 1993

Terry A. DeCudde
Notary Public

Ted C. Feigenbaum
Ted C. Feigenbaum
Senior Vice President and Chief Nuclear Officer

I. Introduction and Description of Proposed Changes

A. Introduction

The purpose of the proposed Technical Specification change is to combine Technical Specification 3/4.7.5, Ultimate Heat Sink, with Technical Specification 3/4.7.4, Service Water System, and redefine the requirements for an OPERABLE Service Water System. The design of the Seabrook Station Service Water System employs two redundant loops. Each loop is equipped with two full capacity service water pumps, which use the Atlantic Ocean as the ultimate heat sink, and a cooling tower service water pump which uses the atmosphere as the ultimate heat sink. Seabrook Station's Technical Specifications currently require two OPERABLE Service Water loops with each loop having three OPERABLE pumps (two service water pumps and one cooling tower service water pump) when in Modes 1, 2, 3, and 4. This requirement unnecessarily exceeds single failure criteria since the second service water pump is not required for normal or design basis accident conditions and the associated cooling tower service water pump provides the required redundancy for the postulated design basis event. The proposed change redefines an OPERABLE service water loop as having one OPERABLE service water pump and one OPERABLE cooling tower service water pump. Additional changes are proposed to the duration that a cooling tower service water pump may be inoperable and to the surveillance requirements for service water pumps.

The requirements for transferring primary and secondary system heat loads are currently contained in two Technical Specifications. Technical Specification 3/4.7.4 specifies the requirements for the service water and cooling tower service water pumps and valves. Technical Specification 3/4.7.5 specifies the requirements for the service water pumphouse and the mechanical draft cooling tower. Both Technical Specifications must be met to have an operable system to transfer the required heat loads. This proposed change would consolidate these requirements into one Technical Specification.

The Service Water System is designed such that in the event of a Loss of Coolant Accident (LOCA) concurrent with a loss of offsite power, a single service water pump supplying a single flow train powered from its associated emergency diesel generator will provide sufficient capability to dissipate the heat loads. Service Water System cooling water for each loop is normally supplied by one of the two service water pumps which are located in the service water pumphouse. Cooling water is supplied to the service water pumphouse from the Atlantic Ocean via underground tunnels. In addition, to the service water pumphouse, a Seismic Category 1 mechanical draft cooling tower, with one cooling tower service water pump per loop, provides the required cooling water flow should the service water pumphouse fail to provide a sufficient supply of water due to seismic failure of the tunnels (see Figure 1).

A cooling tower actuation signal is generated if low service water pressure is sensed by two out of three loop pressure instruments and at least one service water pump breaker closed. These pressure instruments are safety related Class 1E devices. A tower actuation signal must be manually initiated if both service water pump breakers are open due to maintenance and/or electrical fault to transfer the cooling water supply from the service water pumphouse to the cooling tower.

Each service water pump is capable of supplying 100 percent of the flow required by a single loop to dissipate plant heat loads during normal full power operation and during postulated accident conditions. The cooling tower service water pump in each loop is also capable of providing 100 percent of the required cooling water flow in

that loop to dissipate heat loads during the design basis event upon failure of the service water pumphouse tunnels. Thus, Technical Specifications currently require that the Service Water System have two OPERABLE loops with three OPERABLE pumps in each loop, each capable of dissipating post-LOCA heat loads.

North Atlantic performed a Probabilistic Risk Assessment of the proposed change in service water system requirements to one operable pump, the revised AOTs for two service water pumps within the same loop, and the revised AOT for one cooling tower service water pump, to determine their impact on core damage frequency. This PRA evaluation modified the Service Water System fault tree model to reflect the longer allowed outage times (AOT's) for planned or corrective maintenance on the Service Water System during power operation. The results of the evaluation indicate the proposed changes will have a minor effect on system unavailability and a small impact ($2.5E-6$ per year) on the core damage frequency (CDF). This change in CDF is insignificant within the uncertainty bounds of the CDF distribution. The Service Water System Probabilistic Risk Assessment is enclosed herein in Section VIII.

B. Description of Proposed Changes

The current Technical Specification requirement to have three OPERABLE pumps per service water loop is overly restrictive. As stated in the UFSAR, the Service Water System is designed to dissipate the heat loads of the design basis event using one of the six pumps (two service water pumps and one cooling tower service water pump per loop). In addition, the proposed changes to Technical Specification 3/4.7.4 will enhance plant operation by providing greater flexibility in planning and performing maintenance on the Service Water System. Most maintenance on the pumps is currently performed during refueling outages due to the restrictive nature of the current Technical Specifications. Performing planned maintenance at times other than during outages would provide greater flexibility in outage planning and would likely improve plant and component reliability. The proposed changes will also permit the performance of unplanned maintenance during plant operation while minimizing plant heatup and cooldown cycles.

The proposed changes to Technical Specification 3/4.7.4 are described below:

1. The Limiting Condition for Operation will be changed as follows:
 - a. Service Water System OPERABILITY will be defined in terms of service water loops and the service water pumphouse, cooling tower service water loops and the mechanical draft cooling tower, and the cooling tower makeup system,
 - b. An OPERABLE service water loop will be defined as consisting of one OPERABLE service water pump and an OPERABLE cooling tower service water pump. The standby pump is removed from Technical Specifications still leaving redundant loops each with redundant pumps capable of providing adequate service water flow to dissipate heat loads during the design basis event. A Probabilistic Risk Assessment Evaluation performed by the North Atlantic Reliability and Safety Engineering Group demonstrates that the change in core damage frequency associated with this change is insignificant within the bounds of uncertainty.
2. Action Statement (a), which permits operation with one inoperable service water pump for seven days, will be deleted.

3. Action Statement (b), which permits operation with two service water pumps inoperable (one inoperable pump in each loop) for 72 hours, is deleted.
4. Action Statement (c), which permits operation with two service water pumps in one loop inoperable for 24 hours, is deleted.
5. Action Statement (d), which permits operation with a cooling tower service water pump inoperable for 72 hours, is deleted.
6. Proposed Action Statement (a) permits an inoperable service water loop for up to 72 hours. The 72 hour Allowed Outage Time (AOT) is consistent with the Standard Technical Specifications for Westinghouse Pressurized Water Reactors (NUREG-1431). This AOT will apply to the entire service water loop flowpath with the exception of the associated cooling tower service water pump, as discussed above.
7. Proposed Action Statement (b) increases the AOT for the cooling tower service water pumps from 72 hours to seven days. This change is based on the lower contribution to risk of the cooling tower service water pumps as compared to the normally operating service water pumps. The acceptability of this change is supported by the Service Water System Probabilistic Risk Assessment Evaluation (Section VIII).
8. Proposed Action Statement (c) specifies a 72 hour AOT for two cooling tower loops or the mechanical draft cooling tower. This is consistent with the existing AOT for the cooling tower in Technical Specification 3/4.7.5.
9. Proposed Action Statement (d) specifies a 24 hour AOT for two loops other than the two cooling tower loops and for the service water pumphouse.
10. Proposed Action Statement (e) specifies a 72 hour AOT for the portable tower makeup pump system. Currently, Technical Specification 3.7.5 ACTION d., does not specify an AOT for the portable tower makeup pump. If this pump is inoperable for reasons other than improper storage, a one hour report is required. This is consistent with the current requirement in Technical Specification 3/4.7.5.
11. Proposed Surveillance Requirement 4.7.4.1 incorporates existing Surveillance Requirements 4.7.4.a and 4.7.4.b.1 as they apply to the service water loops. The requirement specified in Surveillance Requirement 4.7.4.b.2 to verify that each of the four service water pumps starts automatically upon loss of or failure to start of the redundant pump within the loop is deleted. With the standby service water pump not required for loop OPERABILITY, the basis for testing the automatic start capability of these pumps as a Technical Specification Surveillance no longer exists. The deletion of this portion of Surveillance Requirement 4.7.4.b.2 does not affect the regular inservice testing which is performed on the service water pumps and cooling tower service water pumps as required by Technical Specification Surveillance Requirement 4.0.5. The OPERABILITY of the service water pumps and cooling tower service water pumps is demonstrated during quarterly inservice testing of these pumps as required by North Atlantic Procedure MA 6.4 "Inservice Testing of Pumps."
12. Proposed Surveillance Requirement 4.7.4.2 incorporates existing Surveillance Requirements 4.7.4.a and 4.7.4.b.1 as they apply to the cooling tower loops.

In addition, it incorporates existing Surveillance Requirement 4.7.5.d.1 and adds a Surveillance Requirement to verify that the service water cooling tower pumps start on a Tower Actuation signal.

13. Proposed Surveillance Requirement 4.7.5.3 incorporates existing Surveillance Requirement 4.7.5.a.1.
14. Proposed Surveillance Requirement 4.7.4.4 incorporates existing Surveillance Requirements 4.7.5.a.2, 4.7.5.b, 4.7.5.c, and 4.7.5.d.2.
15. Technical Specification 3/4.7.5 will be deleted.
16. Bases 3/4.7.4, Service Water System, is revised to add additional details concerning Service Water System operation and to incorporate the bases for Technical Specification 3/4.7.5.
17. Bases 3/4.7.5, Ultimate Heat Sink, will be deleted.

In summary, all of the requirements of Technical Specification 3/4.7.5 have been incorporated in the proposed Technical Specification 3/4.7.4.

Seabrook Station Technical Specification 3/4.7.5 specifies the requirements for the ultimate heat sink. This specification has been consolidated into the proposed Technical Specification 3/4.7.4. This consolidation is proposed to reduce the potential for confusion between the Specifications and to control station operation in a manner consistent with the station design basis. The ultimate heat sink is the Atlantic Ocean when the service water pumps are utilized and the atmosphere when the cooling tower service water pumps are utilized.

Figure 1
Service Water System

