North Atlantic

SEABROOK STATION UNIT 1

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

LICENSE AMENDMENT REQUEST 98-17,
"CHANGE TO TECHNICAL SPECIFICATION SURVEILLANCE REQUIREMENT 4.5.2b.1, VERIFICATION OF ECCS PIPING IS FULL OF WATER"

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 Safety Assessment for Proposed Change
- Section II - Markup of Proposed Change
- Section III - Retype of Proposed Change
- Section IV - Determination of Significant Hazards for Proposed Change
- Section V - Proposed Schedule for License Amendment Issuance and Effectiveness
- Section VI - Environmental Impact Assessment

Sworn and Subscribed
before me this
4th day of November, 1998

Notary Public

Ted C. Feigenbaum
Executive Vice President and Chief Nuclear Officer

Section I

Introduction and Safety Assessment for the Proposed Change

I. INTRODUCTION AND SAFETY ASSESSMENT OF THE PROPOSED CHANGE

A. Introduction

License Amendment Request (LAR) 98-17 proposes a change to the Seabrook Station Technical Specification (TS) Surveillance Requirement (SR) 4.5.2b.1 to remove the prescriptive requirements of using the venting process as the sole means to verify that the Emergency Core Cooling System (ECCS) piping is full of water. Removal of the prescriptive requirements will provide North Atlantic operational flexibility and will allow the use of alternative techniques to verify the ECCS piping is full of water. In addition, the Bases associated with TS 3/4.5.2 will be expanded to reflect the intent of the surveillance requirement.

The proposed change is similar to SR 3.5.2.3 and its associated Bases contained in NUREG-1431, "Standard Technical Specifications - Westinghouse Plants," Rev. 1, April 1995. In addition, the proposed change is based on License Amendments for Commonwealth Edison Company's Byron Station Units 1 & 2 and Braidwood Station Units 1 & 2, that were approved by the NRC Staff as License Amendments 79 and 71, on February 16, 1996.

B. Safety Assessment

The Emergency Core Cooling System (ECCS) is designed to supply core cooling and negative reactivity to ensure the reactor is cooled and shutdown following a postulated accident. The ECCS consists of the Centrifugal Charging Pumps (CCP), Safety Injection Pumps (SIP), a Refueling Water Storage Tank (RWST), the Residual Heat Removal pumps (RHR), the residual heat removal heat exchanger, the safety injection accumulators, and the associated valves and piping.

Technical Specification Surveillance Requirement 4.5.2b.1 states, in part, "Each ECCS subsystem shall be demonstrated OPERABLE at least once per 31 days by verifying that the ECCS piping is full of water by venting the ECCS pump casings (excluding the operating centrifugal charging pump) and accessible discharge piping high points." With the exception of the operating centrifugal charging pump, the ECCS pumps are normally in a standby, non-operating mode. As such, flow path piping has the potential to develop voids and pockets of entrained gases. Maintaining the ECCS piping full of water ensures that the system will perform properly and will be capable of performing its specified function by injecting its full capacity into the Reactor Coolant System (RCS) upon demand. In addition, a full ECCS prevents hydraulic transients, pump cavitation, and pumping of non-condensable gas (e.g., air, nitrogen, or hydrogen) into the reactor vessel following a safety injection (SI) signal or during shutdown cooling. The 31 day frequency takes into consideration the gradual nature of gas accumulation in the ECCS piping and the procedural controls governing system operation.

The "intent" of the surveillance requirement is to ensure that the ECCS pumps and delivery piping remain full of water to preserve the safety function of the ECCS. The prescriptive requirement is to vent ECCS pump casings and accessible discharge piping high points. Experience has shown that venting of ECCS piping on a monthly basis involves activities that are labor intensive (e.g., removal and installation of pipe caps, venting rigs, temporary tubing, and containers to collect and dispose of radioactive liquid), with increased radiological exposure to the workers. In addition, there are personnel safety concerns due to potential exposure to high pressure fluids and radioactive gasses coming out of solution during the

venting process. Further, should a postulated accident occur at the time of venting, there is the potential for degrading ECCS flow delivery to the RCS should the operator fail to close the manual vent valve.

Venting pump casings and piping high points is a common industry practice to determine if the ECCS piping is full of water and for the removal of pockets of entrained gases and voids within piping systems. However, the industry has experience in the use of ultrasonic testing (UT) as an alternative technique for verifying piping is full of water. Recently, the NRC Staff has recognized that UT is an acceptable alternative technique to determine if the ECCS piping is full of water. UT is unique as compared to venting in that it affords the opportunity to determine if the piping is full of water without the need of breaching the system. Further, determination that piping is full of water without breaching the system eliminates the aforementioned activities and concerns associated with the venting process. Only if the piping is determined not to be full of water would venting be required.

Presently, North Atlantic's surveillance procedure associated with verification of SR 4.5.2b.1 employs UT as a backup method to assess the extent of air/gas/void in additional sections of ECCS piping if venting reveals the presence of air/gas at the accessible piping high points. The surveillance procedure contains the acceptance criteria and required actions (e.g., evaluation, notification of shift management and support organizations, UT, etc.) to ensure the ECCS piping and pump casings remain full of water.

UT is essentially a go-no-go acceptance criterion. If the pipe is determined to be full of water, the surveillance requirement will be met. If the UT reveals that the pipe is not full of water, the surveillance requirement is not met and associated actions are taken, e.g., filling and venting.

The use of UT to determine if ECCS piping is full of water is controlled by North Atlantic procedures. Currently, North Atlantic uses either of two techniques, pulse-echo and through-transmission, for UT. Either technique is suitable for the determination if ECCS piping is full of water. Both techniques have been confirmed as satisfactory for go-no-go testing with the use of either calibration test pieces of piping of similar diameter and material composition or calibrated on actual plant piping. The confirmation calibrations were also used on piping under flow conditions. The confirmation methods employed are inherently conservative since a signal must be captured to show that the pipe is full of water. Any loss of signal would be identified as a pipe not being full of water.

The pulse-echo technique consists of exciting a transducer to generate a longitudinal sound wave that travels diametrically through dense materials. If the pipe is full of water, the sound will travel through the water, bounce off the far wall of the pipe and return to the transducer. The time it takes for the sound wave to travel round trip is converted into distance which equals the diameter of the pipe. If the UT is performed from the high point of a partially water filled pipe, the sound wave will not pass through the air gap, thus providing a go-no-go test.

The through-transmission technique uses separate transducers for transmitting and receiving longitudinal sound waves. The transducers are placed diametrically opposite each other and the sound wave is passed from one transducer to the other. As with the pulse-echo technique, if an air gap is present the sound wave will not propagate through the air gap and no signal would be captured by the receiving transducer.

Incorporation of a non-prescriptive surveillance requirement and associated Bases, similar to SR 3.5.2.3 as contained in NUREG-1431, will provide North Atlantic with the operational flexibility and allow discretion to use the most suitable deterministic method of ensuring that the ECCS piping is full of water.

Section II

Markup Of The Proposed Change

The attached markup reflects the currently issued revision of the Technical Specifications listed below. Pending Technical Specifications or Technical Specification changes issued subsequent to this submittal are not reflected in the enclosed markup

The following Technical Specification is included in the attached markup:

Technical Specification	Title	Page(s)
4.5.2b.1	ECCS Subsystems - T_{avg} Greater Than Or Equal To 350°F	3/4 5-5
Bases 3/4.5.2	ECCS Subsystems	B 3/4 5-2