North Atlantic

SEABROOK STATION UNIT 1

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

License Amendment Request No. 99-02,
"Operation with Relaxed Axial Offset Control and Continued Use of the Fixed Incore Detector System"

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

I, Ted C. Feigenbaum, Executive Vice President and Chief Nuclear Officer of North Atlantic Energy Service Corporation hereby affirm that the information and statements contained within this License Amendment Request are based on facts and circumstances which are true and accurate to the best of my knowledge and belief.

Sworn and Subscribed
before me this
2nd day of November, 1999

Susan Ulm
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 PROPOSED CHANGES

A. Introduction

LAR 99-02 propose changes to the Seabrook Station Technical Specifications (TS) to implement the Relaxed Axial Offset Control (RAOC) strategy. The RAOC TS, developed by Westinghouse, has been previously reviewed and approved by the Nuclear Regulatory Commission (NRC), Reference [1]. In addition, current Technical Specifications allow use of the Fixed Incore Detector System (FIDS) for monitoring incore power distributions, therefore, the RAOC TS proposed for incorporation into the Seabrook Station Technical Specifications includes adjustments to allow the continued use of the FIDS, when operable, for monitoring incore power distributions and assuring compliance with the cycle-specific Limiting Conditions for Operation (LCOs) specified in the Core Operating Limits Report (COLR).

The proposed changes are in support of North Atlantic's long-term operating strategy to refuel and operate, commencing with Cycle 8, with upgraded Westinghouse fuel with Intermediate Flow Mixers (VANTAGE+ (w/ IFMs)). Use of these fuel features has been previously approved, Reference [2], by the Nuclear Regulatory Commission (NRC). Westinghouse and Duke Engineering & Services (DE&S) are jointly performing safety evaluations/analyses, using current methodologies, to confirm acceptable use of these features with RAOC for 4-loop operation prior to Cycle 8 operation. The safety analysis methodologies employed by Westinghouse and DE&S have been previously reviewed and approved by the Nuclear Regulatory Commission. The joint effort will also provide appropriate cycle-specific Limiting Conditions for Operation (LCOs) consistent with RAOC for use in the COLR.

B. Safety Assessment of Proposed Changes

As stated above, use of VANTAGE+ (w/ IFMs) and the safety analysis methodologies employed by Westinghouse and DE&S have been previously approved by the NRC and acceptable use of these features for 4-loop operation has been confirmed. Associated changes to the Updated Final Safety Analysis Report (UFSAR) will be separately implemented by North Atlantic's UFSAR change process (UFCR 99-034, "Update to Westinghouse Fuel Designed with Intermediate Flow Mixers and Safety Analyses).

Safety evaluations/analyses are based on assuming Cycle 8 and subsequent transition cycles are operated within the limits of the RAOC Technical Specification developed by Westinghouse. The Westinghouse RAOC Technical Specification has been approved by the NRC, for generic application to Westinghouse PWRs, including Seabrook Station. In addition, current Seabrook Station Technical Specifications allow use of the FIDS, when operable, for monitoring incore power distributions and compliance with cycle-specific Limiting Conditions for Operation (LCOs) specified in the Core Operating Limits Report (COLR). Therefore, the Westinghouse RAOC Technical Specification incorporated in the marked-up pages in Section II include adjustments to allow the continued use of the FIDS, when operable, for assuring compliance with the cycle-specific LCOs in the COLR. The format and content of the Cycle 8 COLR are being revised to reflect operation with RAOC.

The existing, approved, Reference [3], thermal-hydraulic analysis of the 17x17 VANTAGE+ (w/o IFMs) fuel is based on the Revised Thermal Design Procedure (RTDP) and the WRB-1 DNB correlation. Thus, the thermal limit lines in the Technical Specifications reflect approved analysis methodology applied to the current fuel design, VANTAGE+ (w/o IFMs). The DNB analysis of Cycle 8 and subsequent transition cores containing both 17x17 VANTAGE+ (w/o IFMs) and 17x17 VANTAGE+ (w/ IFMs) fuel assemblies has been modified to incorporate the WRB-2 DNB correlation, RTDP, and VIPRE modeling as licensed by Westinghouse (References [1], [4], [5], and [6]). Therefore, the proposed changes to the thermal limit lines reflect updated and approved thermal-hydraulic analysis methodology applied to the new fuel, VANTAGE+ (w/IFMs). The marked-up Technical Specification pages in Section II include a proposed change to the thermal limit lines to reflect use of the approved Westinghouse thermal-hydraulic analysis methodologies.

The existing requirement in TS 3.2.1, Action a.2, to reduce the power range neutron flux high trip setpoints is proposed to be deleted so as to be consistent with NUREG-1431, "Standard Technical Specifications – Westinghouse Plants." Also, justification of this deletion is based on Westinghouse Owners Group (WOG) letter OG-90-54 to the NRC (Jose Calvo) dated September 5, 1990. The potential for a reactor trip caused by the setpoint adjustment is not justified. Reducing the power level to less than or equal to 50 percent rated thermal power (RTP) maintains the plant in a benign condition since under RAOC methodology there are no axial flux difference (AFD) limits below 50 percent of RTP. In addition, a rapid rise in power to greater than 50 percent RTP with AFD outside limits does not immediately create an unacceptable situation. Since the transient analysis setpoint calculations for f (ΔI) (input to the overtemperature delta-temperature (OTΔT) trip function) are based on the same core power distributions that the fuel designers use for a reload cycle design, the OTΔT trip function provides an acceptable level of protection for such an excursion. It is also noted that the event would be successfully terminated by a trip at the previous setpoint level. Therefore, maintaining this provision as part of TS 3.2.1, Action a.2 is not warranted. The NRC, Reference [7], approved a similar TS change request by Southern Nuclear Operating Company for the Joseph M. Farley Nuclear Plant, dated June 12, 1996.

The explicit requirement to identify and correct the cause of the out-of-limit condition in TS 3.2.2, Action a.2., and TS 3.2.3, Action b., is proposed for deletion. This type of statement is not included in NUREG-1431 on the basis that it is implicit that the out-of-limit condition would have to be corrected in order to restore compliance with the LCO. This change is considered to be an editorial simplification of the specifications. The NRC also approved this TS change for the Joseph M. Farley Nuclear Plant, Reference [7].

Technical Specification 6.8.1.6.b lists the approved analysis methodologies used for determining the cycle specific core operating limits specified in the COLR. The current methodologies employed by DE&S are retained and the methodologies employed by Westinghouse are added. This retains the flexibility to resolve future emergent licensing issues using either analysis methodology when licensed to do so, as well as allowing the joint safety evaluations/analyses performed now and in the future.

The proposed changes are summarized in the following table.

Page	Tech Spec or Bases	Description of Change	Justification (See text for more discussion)
2-2	2.1.1	Revised Thermal Limit Lines.	Based on approved Westinghouse DNB analysis methodologies using WRB-2, RTDP, and VIPRE.
2-8	2.2.1	Revised the definition of T′.	The definition is made consistent with the definition of T″ in the Tech Specs and with the definition of T′ currently found in the COLR.
B 2-1	B 2.1.1	Deleted value for enthalpy rise hot channel factor, revised text to indicate that it is found in the COLR, and revised the equation to add a variable versus a fixed value.	Reflects use of the Westinghouse RTDP analysis methodology.
B 2-4	B 2.2.1	Deleted the numerical value for DNBR, and replaced it with a statement that it is greater than or equal to the DNBR limits.	Based on approved Westinghouse DNB analysis methodologies using WRB-2, RTDP, and VIPRE.
3/4 2-1	3.2.1	Deleted Action a.2. requirement to reduce Power Range Neutron Flux - High Setpoints	Based on consistency with NUREG-1431 and WOG letter OG-90-54.
3/4 2-1 3/4 2-2 3/4 2-6	3.2.1 3.2.2	Revised specification to reflect F_Q methodology.	Reflects use of the Westinghouse approved RAOC Tech Spec adjusted to allow continued use of the FIDS, when operable.
3/4 2-4 3/4 2-8	3.2.2 3.2.3	Deleted the explicit Action requirement to identify and correct the cause of the out-of-limit condition.	Editorial simplification. This type of statement is not included in NUREG-1431.
3/4 2-8	3.2.3	Corrected the LCO on $F^N_{\Delta H}$.	Corrects a typo in the acronym "COLR". Corrects the upper limit on $F^N_{\Delta H}$ to be consistent with the safety analysis.
B 3/4 2-3	B 3/4.2.2 B 3/4.2.3	Replaced FIDS Bases discussion with F_Q discussion.	Reflects use of the Westinghouse approved RAOC Tech Spec.
6-18A 6-18B 6-18C	6.8.1.6.b.	Provided additional approved methodology references.	Reflects both DE&S and Westinghouse approved reload analysis methodologies.

References

[1] WCAP-10216-P-A, Revision 1A (Proprietary), Relaxation of Constant Axial Offset Control F_Q Surveillance Technical Specification, February 1994.

[2] Davidson, S. L. (Ed.), et al., VANTAGE 5 Fuel Assembly Reference Core Report, WCAP-10444-P-A and Appendix A, September 1985; Addendum 1-A, March 1986; Addendum 2-A, April 1988.

[3] YAEC-1849P, Thermal-Hydraulic Analysis Methodology Using VIPRE-01 for PWR Applications, October 1992.

[4] WCAP-11397-P-A, (Proprietary), Revised Thermal Design Procedure, April 1989.

[5] WCAP-14565-P, (Proprietary), VIPRE-01 Modeling and Qualification for Pressurized Water Reactor Non-LOCA Thermal-Hydraulic Safety Analysis, April 1997.

[6] Letter from T. H. Essig (NRC) to H. Sepp (Westinghouse), Acceptance for Referencing of Licensing Topical Report WCAP-14565-P, (Proprietary), "VIPRE-01 Modeling and Qualification for Pressurized Water Reactor Non-LOCA Thermal-Hydraulic Safety Analysis", January, 1999.

[7] Letter from Byron L. Siegel (NRC) to D. N. Morey (Southern Nuclear Operating Company), Issuance of Amendments - Joseph M. Farley Nuclear Plant Units 1 and 2, (TAC Nos. M95700 and M95701), September 3, 1996.

Section II

Markup of the Proposed Change

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

The following Technical Specifications are included in the attached markup:

Technical Specification	Title	Page(s)
Figure 2.1.1	Reactor Core Safety Limit – Four Loops In Operation	2-2
Table 2.2.1	Reactor Trip System Instrumentation Trip Setpoints - Table Notations	2-8
B 2.1.1	Safety Limits Bases – Reactor Core	B 2-1
B 2.2.2	Limiting Safety System Settings – Reactor Trip System Instrumentation Setpoints -	B 2-4
3/4.2.1	Axial Flux Difference	3/4 2-1, 3/4 2-2
3/4.2.2	Heat Flux Hot Channel Factor – $F_Q(Z)$	3/4 2-4, 3/4 2-6
3/4.2.3	Nuclear Enthalpy Rise Hot Channel Factor	3/4 2-8
B 3/4.2.2 and B 3/4.2.3	Bases 3/4.2.2 and 3/4.2.3 Heat Flux Hot Channel Factor and Nuclear Enthalpy Rise Hot Channel Factor	B 3/4 2-3
6.8.1.6.b	Administrative Controls – Core Operating Limits Report	6-18A, 6-18B, 6-18C