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Electric and Gas
Company

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Vice President and Chief Nuclear Officer

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United States Nuclear Regulatory Commission
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Gentlemen:

CYCLE 5 RELOAD ANALYSIS
FACILITY OPERATING LICENSE DPR-75
UNIT NO. 2
SALEM GENERATING STATION
DOCKET NO. 50-311

Salem Unit No. 2 has completed its fourth cycle of operation on August 31, 1988. The burnup at the end of Cycle 4 was 17,882 MWD/MTU. This letter is to inform you of PSE&G's plans regarding Salem Unit No. 2 Cycle 5 reload core which is expected to achieve a burnup of 15,600 MWD/MTU.

The Cycle 5 reload core will utilize 84 new Region 7 Westinghouse 17 x 17 fuel assemblies consisting of 48 assemblies at 4.0 w/o enrichment and 36 assemblies at 3.6 w/o enrichment (see attached Figure 1). Figure 1 also shows the arrangement of the fresh burnable absorber rodlets used in this design. The mechanical design of the Region 7 fuel assemblies is the same as the Region 6 assemblies except for the use of standardized fuel pellets and the Reconstitutible Top Nozzle (RTN) design. The Westinghouse standardized fuel pellet incorporates a reduced pellet length and modifications to the chamfer and dish size in order to improve manufacturability while maintaining performance. The RTN features a removable nozzle which improves access to the fuel rods for examination and replacement. In conjunction with the RTN a long tapered fuel rod bottom end plug is used to facilitate removal and reinsertion of individual fuel rods.

Westinghouse has completed the safety evaluation of the Cycle 5 reload core design utilizing the methodology described in Reference 1 and introduced the Westinghouse Advanced Nodal Code (ANC), Reference 2, to perform neutronics analyses. Based on this methodology, those incidents analyzed and reported in the Salem

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UFSAR that could potentially be affected by the fuel reload were addressed. The dropped RCCA event was evaluated based on the methodology described in Reference 3. For steam line break incidents at pressures below 1000 psia, the DNBR limit of 1.45 was utilized in the safety analysis (Reference 4).

The safety evaluation states that all Cycle 5 kinetics parameters, control rod worths, and core peaking factors meet current limits with the exception of the normalized trip reactivity insertion rate which is slightly different from the current limit. The effects of this different normalized trip reactivity insertion rate were evaluated and all previous analyses were found to remain applicable with the exception of the Loss of Flow (LOF) event. The LOF transients were analyzed using the Cycle 5 trip reactivity shape and demonstrated that the DNB ratio did not decrease below the limit value. The Radial Peaking Factor Limit Report for Salem Unit No. 2 Cycle 5 was previously submitted in Reference 5.

Five Salem Unit No. 2 Technical Specification changes have been approved for implementation starting in Cycle 5. These changes are 1) removal of the boron injection tank (BIT), 2) increasing the minimum boron concentrations of the refueling water storage tank (RWST) and accumulators, 3) removal of RTD bypass piping, 4) change from P-7 to P-9 for reactor trip block with turbine trip, and 5) elimination of coincident logic (one-out-of-four) for reactor coolant pump breaker position reactor trip above P-8. These changes have been considered in the Cycle 5 reload analysis.

PSE&G has reviewed the basis of the Cycle 5 reload analysis and the Westinghouse Reload Safety Evaluation Report with Westinghouse. We have determined that all the postulated events are within allowable limits and that no unreviewed safety questions as defined by 10CFR50.59 are involved with this reload. Therefore, based on this review, application for amendment to the Salem Unit No. 2 operating license is not required.

The reload core design will be verified during the startup physics testing program. The program will include, but is not limited to the following tests:

1. Control rod drive tests and drop time measurements
2. Critical boron concentration measurements
3. Control rod bank worth measurements
4. Moderator temperature coefficient measurements
5. Power distribution measurements using the incore flux mapping system

Should you have any questions, we will be pleased to discuss them with you.

Sincerely,



Attachment

- References:
- 1) Bordelon, F. M., et al., "Westinghouse Reload Safety Evaluation Methodology", WCAP-9273-A, July 1985.
 - 2) Liu, Y. S., et al., "ANC : A Westinghouse Advanced Nodal Computer Code", WCAP-10966-A, September 1986.
 - 3) Morita, T., et al., "Dropped Rod Methodology for Negative Flux Rate Trip Plants", WCAP-10298-A, June 1983.
 - 4) Westinghouse letter dated March 25, 1986, NS-NRC-86-3116, "Westinghouse Response to Additional Request on WCAP-9226-P/WCAP-9227-N-P, "Reactor Core Response to Excessive Secondary System Release", (non-proprietary).
 - 5) Letter S. E. Miltenberger (PSE&G) to W. T. Russell (NRC), "Cycle 5 Radial Peaking Factor Limit Report, Facility Operating License DPR-75, Unit No. 2, Salem Generating Station, Docket No. 50-311", August 31, 1988.

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