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Dr. Thomas E. Murley, Administrator
Region 1
U.S. Nuclear Regulatory Commission
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Mr. Steven A. Varga, Director
U. S. NRC PWR Project Directorate #3
Division of PWR Licensing A
7920 Norfolk Avenue
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Gentlemen:

INTERPRETATION OF TECHNICAL SPECIFICATIONS
FOR THE NEW WESTINGHOUSE FUEL ASSEMBLIES
SALEM GENERATING STATION
UNIT NOS. 1 AND 2
DOCKET NOS. 50-272 AND 50-311

Through discussions with Mr. D. C. Fischer, NRC Licensing Project Manager for the Salem Facility, we have become aware of differences in interpretation of a Technical Specification which has arisen at several nuclear plants that are now using new higher density fuel assemblies provided by Westinghouse Electric Corporation. This letter clarifies the interpretation used by PSE&G in the Salem 1, Cycle 7 Reload Safety Evaluation.

The specification in question defines the maximum weight of the fuel pins to be 1766 grams. The PSE&G interpretation has been that the maximum of the batch average pin weights in a given core reload must meet this specification. This interpretation is based on the following facts:

1. The local distribution of weight among the fuel pins within an assembly, and among assemblies, has a negligible effect on the core physics parameters and is not a significant factor in any safety analyses.

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2. The average pin weight in a reload batch has a very small effect on the core physics, and is considered in the design of each fuel cycle.

The attached safety evaluation, provided by Westinghouse Electric Company and reviewed by PSE&G, supports these conclusions.

The batch average fuel pin mass for region J (the new higher density fuel) is 1762 grams. This represents a 1.0% increase from the batch H average fuel pin mass (standard fuel) which was 1745 grams. This increase in mass has been considered in the Salem 1 Cycle 7 Reload Safety Evaluation. The distribution of pin masses for the higher density fuel is about 6 grams, or 0.3% at the 1 level. This is essentially the same as the distributions of previous reloads.

The Salem 1 Cycle 7 Reload Safety Evaluation compared the Region J pin mass of 1762 grams to the Tech Spec value of 1766 and has concluded that no Tech Spec changes were required. This same procedure was used in the Safety Evaluations of the previous Salem 1 Cycle 6, and Salem 2 Cycle 3 safety evaluations.

Based on the above interpretation, it is our position that we are, and have been, in compliance with the Technical Specifications. However, to eliminate any future misunderstanding, we will submit a request for amendment to our licenses for Salem Unit Nos. 1 and 2 that removes that reference to individual fuel rod uranium weight. It is our understanding that this value was deleted from the Farley Unit 2 Technical Specifications as part of Amendment No. 56 issued on April 22, 1986.

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

Sincerely,

C A McNeill / JTP

Attachment

C Mr. Donald C. Fischer
Licensing Project Manager

Mr. Thomas J. Kenny
Senior Resident Inspector

SAFETY EVALUATION JUSTIFYING CONTINUED OPERATION WITH URANIUM ROD WEIGHT DISCREPANCY

The Design Features section of the Technical Specifications identifies a maximum total weight of uranium in each fuel rod. Due to fuel pellet design improvements such as chamfered pellets with reduced dish and a nominal density increase, the fuel weight has increased slightly. The actual uranium weight has no bearing on the power limits, power operating level or decay heat rate. Although a number of areas involving safety analysis are affected by fuel uranium weight, the areas of safety significance have their own limits which are reflected in the FSAR and Technical Specifications. Technical Specifications on power and power distribution control the fission rate and, hence, the rate of decay heat production. The composition of the fuel is closely monitored to assure acceptable fuel performance for such things as thermal conductivity, swelling, densification, etc. The important fuel parameters have been considered and are addressed in the following evaluation as pertaining to Westinghouse supplied components and services.

Seismic Effects on Fuel/Internals and New and Spent Fuel Storage Racks
The fuel rod uranium weight as stated in the Technical Specifications is not a direct input to the analyses of maximum seismic/LOCA fuel assembly dynamic response, seismic response of reactor vessel and internals, or seismic analyses of new and spent fuel storage racks.

Radiological Source Terms
Fission product generation is not sensitive to the mass of fuel involved but to the power level. As long as the power generated by the core is unaffected, there will be no significant impact on the radiological source terms.

Fuel Handling
Any postulated increase in the amount of uranium in the fuel rods would not have a significant impact on the fuel handling equipment. The spent fuel pit bridge and hoist is designed with a load limit of approximately twice the weight of a nominal fuel assembly. The manipulator crane is provided with two load sensors. One load sensor provides primary protection of the fuel assemblies from structural damage if an assembly were to "hang-up". A second load sensor provides backup protection against high lift force with a setpoint above that of the first load sensor. If the setpoints were unchanged despite a slight overall increase in uranium weight, the impact would be to decrease the potential for fuel damage since reducing the difference between the fuel assembly weight and the lift force limit reduces the amount of stress the fuel assembly structure would be exposed to if the assembly were to "hang-up". The manipulator crane margin to capacity limit far exceeds any potential increase in assembly weight due to increases in the fuel rod uranium weight.

LOCA Safety Analysis

Uranium mass has no impact on ECCS LOCA analyses. LOCA analyses are sensitive to parameters such as pellet diameter, pellet-clad gap, stack height shrinking factor and pellet density as they relate to pellet temperature and volumetric heat generation. Fuel mass is not used in ECCS LOCA analyses.

non-LOCA Safety Analysis

Individual fuel rod uranium weight, as reported in the Technical Specifications, is not explicitly modeled in any non-LOCA event. Total uranium present in the core is input into the transient analyses, but is generated using a methodology independent of the value presented in the Technical Specifications. Thus, any change in the number currently in the Technical Specifications does not impact the non-LOCA transient analyses.

Core Design

The mass of uranium is explicitly accounted for in the standard fuel rod design through appropriate modeling of the fuel pellet geometry and initial fuel density. Variations in uranium mass associated with allowable as-built variations but within the specification limits for the pellet dimensions and initial density are accounted for in the reactor core design analyses. The Technical Specification uranium mass value has no impact on margin to reactor core design criteria.

The conclusion of these evaluations is that there is no unreviewed safety question associated with operation of the unit(s) with a fuel rod weight in excess of that defined in Section 5.3.1 of the Technical Specifications.