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SUBJECT: Responds to NRC request for review of certain concerns re Exxon Nuclear Corp ECCS evaluation model.Based on listed review w/Exxon & Westinghouse,stated concerns inapplicable to facility.

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March 26, 1985

Director of Nuclear Reactor Regulation
Attention: Mr. John A. Zwolinski, Chief
Operating Reactors Branch No. 5
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: Loss of Coolant Accident Analysis
R. E. Ginna Nuclear Power Plant
Docket No. 50-244

Dear Mr. Zwolinski:

This letter is in response to a request from members of the NRC staff to address certain concerns regarding Exxon Nuclear Corporation's (ENC) emergency core cooling system evaluation model. We have reviewed these concerns with Exxon Nuclear and with our current fuel vendor and core designer Westinghouse Electric Corporation and, as described below, have reached the conclusion that the stated concerns are not applicable to Ginna.

From 1978 through 1983, Ginna reload fuel was supplied by ENC. The most recent ENC loss of coolant accident analysis for Ginna was performed in Spring 1982 and was submitted to the NRC with our letter dated August 9, 1982. That analysis resulted in a calculated peak clad temperature (PCT) of 1928°F. ENC has confirmed to us that the specific models used for the Ginna analysis did not contain any of the three errors which the NRC Staff has identified to us regarding heat transfer correlations and augmentation factors and mixing assumptions.

Regarding the fourth concern raised by the NRC Staff, the following background information and conclusions are provided. In 1984, RG&E began a transition to Westinghouse fuel. In the analysis performed by Westinghouse for that transition, they evaluated the plant response to all transients which may be affected by fuel type, including the loss of coolant accident. Westinghouse was provided with detailed fuel parameters such as dimensions, densities and enrichments. Westinghouse performed detailed pressure drop measurements on Westinghouse optimized fuel assembly (OFA) design fuel and ENC fuel assemblies. Westinghouse concluded that analyzing a complete core of OFA under LOCA conditions was conservative with respect to any potential combination and configuration of Westinghouse and ENC assembly types. The assumption of modeling a full core of OFA was determined to be conservative for transition cycles for two major reasons:

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1. The increase in core flow area associated with OFA due to the smaller rod diameter has an important impact on flooding rates during reflood. A full OFA core configuration decreases core flooding rates which reduces heat transfer coefficients and results in earlier steam cooling.

2. The OFA has a higher volumetric heat generation rate than the ENC fuel. The analysis assumes that an OFA assembly has the hottest rod and maximum F_H which maximizes the calculated PCT.

Westinghouse also evaluated the impact of any hydraulic resistance difference. The only portion of the LOCA evaluation model impacted by the small hydraulic resistance difference which exists between the ENC and OFA fuel is the core reflood transient. Since the hydraulic mismatch is so small, only crossflows due to smaller rod size and grid designs need to be evaluated. The maximum reflood axial flow reduction for the OFA at any possible peak clad temperature location in the core, resulting from crossflows to adjacent ENC assemblies, has been conservatively calculated to be one percent. Analyses were performed which demonstrated that the maximum PCT penalty possible of OFA fuel during the transition period is 4°F. After this transition, the Westinghouse ECCS analysis will apply to a full-core OFA without the cross flow penalty.

In addition to the factors identified above, the burnup levels and/or power levels of the ENC fuel further assure that the limiting fuel is the OFA fuel. The last region of ENC fuel was loaded in 1983. Four of these fuel assemblies have burnups of at least 11,000 MWD/MTU, while the other assemblies in this region have burnup levels in excess of 20,000 MWD/MTU. Eight fresh ENC fuel assemblies were loaded during the Spring 1984 refueling outage and currently have burnups in excess of 11,000 MWD/MTU. Maximum burnups will remain below the design limits established by ENC. The ENC assemblies are not located in peak power locations for Cycle 15 but have F_Q values at least 5% below that in the limiting OFA locations. The minimum margin to the F_Q limit predicted for an ENC assembly occurs at an elevation where the F_Q limit is 2.29 and the predicted F_Q is 2.125. It should be noted that this value is predicted based on load follow operation, while Ginna typically operates base loaded. As described in our letter dated April 10, 1984, we have loaded four ENC annular fuel pellet demonstration assemblies during the current Cycle 14-15 refueling outage. In addition to the fuel temperature and stored energy benefits which derive from the use of an annular fuel pellet, these assemblies are loaded in the core periphery and have assembly power levels less than 0.8 times core average power. These assemblies have been explicitly modeled in the most recent Westinghouse reload analysis. Thus, these assemblies also are bounded by the OFA fuel analysis.

DATE March 26, 1985
TO Mr. John A. Zwolinski

For the reasons stated above, we have concluded that the analyses performed by Westinghouse with the approved Westinghouse evaluation models bound all fuel currently loaded in the Ginna reactor. This evaluation demonstrates that the limiting fuel type is the Westinghouse OFA fuel. Thus, no reliance is currently made by the ENC LOCA models and potential concerns regarding those codes do not apply to Ginna.

Very truly yours,

Roger W. Kober

Roger W. Kober