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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

March 10, 1980

Docket Nos. 50-325
and 50-324

Mr. J. A. Jones
Executive Vice President
Carolina Power & Light Company
336 Fayetteville Street
Raleigh, North Carolina 27602

Dear Mr. Jones:

During the last several years, data have begun to indicate that the fission gas release rate from LWR fuel pellets is increased (enhanced) with burnup. Many of the current fuel performance analyses do not consider the impact of burnup release on safety. By letters dated November 23, 1976, the NRC staff requested all LWR licensees to assess the higher fission gas release for fuel burnups above 20,000 Megawatt-day per metric ton (MWD/T).

Also, by NRC staff letter dated January 18, 1978, all U. S. LWR fuel suppliers were requested to revise their fuel performance analyses to include the enhancement of fission gas release at higher burnups.

All responses to the November 23, 1976 letters have been reviewed. We have concluded that no immediate licensing action is required for operating reactors. This conclusion is valid for typical reported LWR fuel bundle and batch burnups. Any extension of these burnups or other factors which significantly affect fission gas release, LOCA PCT or fuel rod internal pressure is outside the scope of the conclusion.

The effect of enhanced release on BWR ECCS performance has been discussed with General Electric (GE). GE has pointed out that because of operational restrictions and physical limitations, the LOCA analysis is not limiting in high burnup fuel (25,000 MWD/T). High burnup fuel generally cannot achieve linear power densities near the LOCA limit early in cycle. The limiting fuel bundle is usually in its second cycle of reactor operations where burnup levels are below ≈20,000 MWD/T. Late in a BWR fuel cycle, there is less axial power peaking reducing the feasibility for any given axial location to exceed LOCA linear power density limits, and the fuel bundle power is generally limited by MCPR considerations. Thus, it is unlikely that a high burnup bundle can exceed the ECCS performance criteria in case of a LOCA. The argument is appropriate for Exxon fuel bundle design also based on the review of Exxon analyses for operating BWRs. Therefore, no immediate licensing action is necessary on operating BWRs.

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Inasmuch as you and/or the staff will be evaluating all future reloads against fuel vendors' revised fuel performance codes which provide for increase in fission gas release at higher burnups, we consider this a satisfactory resolution of this concern.

Sincerely,

Thomas A. Ippolito, Chief
Operating Reactors Branch #3
Division of Operating Reactors

cc: See next page

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