UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 301 TO FACILITY OPERATING LICENSE DPR-38

AMENDMENT NO. 301 TO FACILITY OPERATING LICENSE DPR-47

AND AMENDMENT NO. 301 TO FACILITY OPERATING LICENSE DPR-55

DUKE ENERGY CORPORATION

OCONEE NUCLEAR STATION, UNITS 1, 2, AND 3

DOCKET NOS. 50-269, 50-270, AND 50-287

1.0 INTRODUCTION

By letter dated September 30, 1998, Duke Energy Corporation (the licensee) submitted a request for changes to the Oconee Nuclear Station, Units 1, 2, and 3, Updated Final Safety Analysis Report (UFSAR). The requested changes would increase the maximum fuel rod internal pressure in the spent fuel pool from 1200 pounds per square inch gauge (psig) to 1300 psig by changing the UFSAR reference to the computer code used to determine the fuel rod internal pressure (TACO3 computer code would be added) in UFSAR, Chapter 15. In addition, the amendments justify not increasing the overall effective decontamination factor for iodine as a consequence of a fuel handling accident and change the terminology used in the UFSAR from "fuel assembly gap gas pressure" to "fuel rod internal pressure." The licensee concluded that the assumptions for the fuel handling accident dose calculation need not change, despite the increase in the maximum rod internal pressure.

2.0 BACKGROUND

The licensee stated that approval of this request would permit full utilization of fuel mechanical reload analysis capabilities provided by the TACO3 computer code, which is described in BAW-10162P-A, "TACO3 Fuel Pin Thermal Analysis Computer Code," Babcock & Wilcox Fuel Company, dated November 1989. The TACO3 computer code methodology has previously been submitted to the NRC in DPC-NE-2008P-A, "Fuel Mechanical Reload Analysis Methodology Using TACO3," dated January 1995. The licensee stated that approval of this request is needed to permit Duke to fully utilize this methodology to provide increased flexibility in fuel cycle designs.

3.0 EVALUATION

The staff reviewed the licensee's justification for not assuming a decreased effective iodine decontamination factor (DF) for the spent fuel pool despite the proposed increase in maximum fuel rod internal pressure. Regulatory Guide (RG) 1.25, "Assumptions Used for Evaluating the Potential Radiological Consequences of a Fuel Handling Accident in the Fuel Handling and Storage Facility for Boiling and Pressurized Water Reactors," specifies conditions for which the

effective iodine DF of 100 is applicable. These conditions include (1) maximum fuel rod pressurization of 1200 psig and (2) a minimum water depth between the top of the damaged fuel rods and the fuel pool surface of 23 feet. RG 1.25 does not provide the methodology used to derive the pool DF assumption, nor does it provide a reference to the bases for the stated values. Since the minimum spent fuel pool depth at Oconee is 21.34 feet, the licensee had previously reduced the effective DF from 100 to 89 to maintain a level of conservatism comparable to that of RG 1.25.

Using the methodology specified in Westinghouse Topical Report WCAP-7828, "Radiological Consequences of a Fuel Handling Accident," dated December 1971, Duke calculated a DF of 443 for a rod internal pressure of 1300 psig and a spent fuel pool depth over the fuel rods of 21.34 feet. This factor is well above the DF of 89 currently used by the licensee in fuel handling accident analyses.

Standard Review Plan (SRP), Section 15.7.4, "Radiological Consequences of Fuel Handling Accidents," states that if factors less conservative than those recommended in RG 1.25 are used, guidance provided by G. Burley, Radiological Safety Branch, Division of Reactor Licensing, NRC, titled, "Evaluation of Fission Product Release and Transport for a Fuel Handling Accident," revised October 5, 1971, should be consulted to determine if an adequate basis for the proposed deviation exists. This evaluation is based, in part, on an earlier Westinghouse Topical Report WCAP-7518, "Radiological Consequences of a Fuel Handling Accident," dated June 1970. The basis of RG 1.25 utilized the experimental data and formulation of WCAP-7518 in a manner intended to assure a conservative result appropriate for licensing purposes. The equation used by the staff at the time RG 1.25 was prepared is identical to that used by the licensee, except that differences occur in the parameter values used in the equation. The overall DF of 100 was arbitrarily chosen as the most probable value from a parametric analysis that varied bubble size and iodine partitioning; therefore, the overall DF of 100 cannot be directly traced to particular parameter values.

In both the licensee's proposed method and RG 1.25, the DF is directly proportional to the bubble contact time, and inversely proportional to pool depth. Thus, the staff finds the licensee's method of calculating DF is in accordance with the bases for assumptions given in RG 1.25. Since the licensee has a current DF that is lower in value than that newly calculated, the staff finds that the licensee's proposal to continue use of the assumed DF value of 89 is acceptable.

In addition, the current fuel handling accident analyses remain valid. The staff reviewed the methodology the licensee used to justify allowing the effective DF to remain the same, and determined it to be acceptable. Therefore, the change to increase the maximum fuel rod internal pressure in the spent fuel pool from 1200 psig to 1300 psig by changing the Updated Final Analysis Report (UFSAR) reference to the computer code used to determine the fuel rod internal pressure (addition of a reference to the TACO3 computer code) in UFSAR, Chapter 15 is acceptable.

Also, staff review of the change in terminology used in the UFSAR from "fuel assembly gap gas pressure" to "fuel rod internal pressure" determined that the change is acceptable since it corrects the UFSAR to the proper terminology used in the industry.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the South Carolina State official was notified of the proposed issuance of the amendments. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendments change requirements with respect to installation or use of a facility component located within the restricted area as defined in Title 10 of the Code of Federal Regulations (10 CFR) Part 20. The NRC staff has determined that the amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendments involve no significant hazards consideration, and there has been no public comment on such finding (63 FR 59590 dated November 4, 1998). Accordingly, the amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendments.

6.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendments will not be inimical to the common defense and security or to the health and safety of the public.

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Date: March 26, 1999