



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO AMENDMENT NO. 85 TO FACILITY OPERATING LICENSE NPF-9  
AND AMENDMENT NO. 66 TO FACILITY OPERATING LICENSE NPF-17

DUKE POWER COMPANY

DOCKET NOS. 50-369 AND 50-370

MCGUIRE NUCLEAR STATION, UNITS 1 AND 2

INTRODUCTION

By letter dated April 1, 1988, Duke Power Company (the licensee) proposed amendments to change Technical Specification (TS) 5.3.1 "Fuel Assemblies" to provide increased flexibility in the substitution of solid stainless steel rods and open water channels (i.e., vacancies) for fuel rods in reconstitutable fuel assemblies to be reinserted in the reactor core during a refueling outage. Presently, TS 5.3.1 requires that each fuel assembly contain 264 fuel rods clad with Zircaloy-4, except that limited substitutions of fuel rods with filler rods consisting of Zircaloy-4 or stainless steel, or by vacancies, may be made in peripheral fuel assemblies if justified by cycle-specific reload analyses. The revised TS 5.3.1 would require that each fuel assembly nominally contain 264 fuel rods clad with Zircaloy-4, except that substitutions of fuel rods by filler rods consisting of Zircaloy-4 or stainless steel, or by vacancies, may be made in fuel assemblies if justified by cycle-specific reload analyses using NRC-approved methodology. The proposed revision would also state that should more than 30 rods in the core, or 10 rods in any assembly, be replaced per refueling, a special report describing the number of rods replaced would be submitted to the Commission pursuant to Specification 6.9.2 within 30 days after cycle startup.

The licensee's letter of April 1, 1988 modified a previous related request dated February 5, 1988, which was not accepted by the NRC because it did not clearly specify requirements for analyses by the licensee to be performed for each reload using NRC-approved methodology.

EVALUATION

The proposed change provides increased flexibility by the removal of "limited substitutions" and "peripheral fuel assemblies." Under the proposed change, limitations on fuel rod substitution or omissions and limitations regarding core locations are those implicit in the justifying analyses required to be performed by the licensee for each fuel cycle using NRC-approved methodology to demonstrate that existing design limits and safety analyses continue to be met.

The term "NRC-approved methodology" includes those methodologies acknowledged in the FSAR and applied in support of issuance of the original operating licenses for McGuire Nuclear Station, Units 1 and 2. Additionally, it includes those subsequent methodologies which have been submitted to and accepted by the staff after the issuance of the McGuire operating licenses.

For example, by letter dated March 13, 1985, the NRC staff approved Duke Power Company's topical report DPC-NF-2010 titled "McGuire Nuclear Station 1/Catawba Nuclear Station Physics Methodology for Reload Design," dated April 1984. As noted in NRC Generic Letter 83-11, "Licensee Qualifications for Performing Safety Analyses in Support of Licensing Actions," each licensee or vendor who intends to use a safety analysis methodology to support licensing actions must demonstrate their proficiency in using the methodology by submitting verification performed by them, not others. Thus, methodologies approved by the NRC for a specific vendor may be used by that vendor in support of McGuire reload design and analysis; use of that methodology by other than that vendor does not constitute "NRC-approved methodology" unless specifically authorized by the NRC.

The proposed flexibility is intended to provide for improved fuel performance by permitting timely removal of individual fuel rods which are found during a refueling outage to be leaking or are deemed to be candidates for future leakage. These improvements in the licensee's fuel performance program will provide for reductions in future occupational radiation exposure and plant radiological releases. The licensee's present goal for fuel reliability improvement (Reference a) is that the cycle average steady-state Iodine-131 activity, corrected for tramp contribution and normalized to a common purification rate, remain below 0.02 microcuries per gram. This corresponds to about 12 leaking fuel rods. The licensee's goal is to achieve one-half the present goal, or 0.01 microcuries per gram, by 1990 and beyond. This will be achieved, in part, by an action plan of outage inspections and reconstitution; if the I-131 activity exceeds 0.05 microcuries per gram any time during the cycle, then all of the reconstitutable assemblies to be reinserted will be examined by special ultrasonic testing (UT) equipment for defects in individual failed rods and results used for reconstitution decisions. Fuel handling, UT, and reconstitution of failed assemblies of a reconstitutable top-nozzle design would be conducted in parallel during refueling outages. The licensee estimates the fuel improvement program will reduce the total station occupational dose by at least 5 to 10 percent. Radiological releases from the station during normal operation would also be significantly reduced because of improved fuel performance.

The requirement for special reporting is consistent with existing TS 6.9.2 and is proposed in response to the NRC's request to be informed in the event a significant deviation from past fuel performances should be observed during a refueling outage.

Accordingly, we find that the proposed revision of TS 5.3.1 does not result in any significant adverse change in the process for determining the adequacy of reload designs and associated safety analyses. The licensee will continue to justify each cycle-specific reload by analyses using NRC-approved methodology in order to demonstrate that existing design limits and safety analysis criteria are met in advance of cycle operation. The proposed change does not increase the probability or consequences of accidents. As discussed above, no adverse changes are being made in the types or amounts of effluents that may be released offsite, and there is no significant increase in the allowable individual or cumulative occupational radiation exposure. The licensee will continue to keep the NRC informed in a timely manner regarding any significant adverse change in its fuel performance program. Therefore, we find the proposed change acceptable.

ENVIRONMENTAL CONSIDERATION

Pursuant to 10 CFR 51.32 the Commission has determined that issuing these amendments will have no significant impact on the environment (53 FR 17991 ).

CONCLUSION

The Commission issued a Notice of Consideration of Issuance of Amendments to Facility Operating Licenses and Opportunity for Hearing which was published in the Federal Register (53 FR 15478) on April 29, 1988. The Commission consulted with the state of North Carolina. No public comments were received, and the state of North Carolina did not have any comments.

We have 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, and (2) such activities will be conducted in compliance with the Commission's regulations, and the issuance of these amendments will not be inimical to the common defense and security or to the health and safety of the public.

REFERENCES:

- (a) Memorandum by Darl Hood, "Summary of March 28, 1988 Meeting on TS Changes Regarding Use of Steel Rods and Open Water Channels in Reconstitutable Fuel Assemblies," dated April 1, 1988, Docket Nos. 50-413/414 and 50-369/370.

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Dated: June 1, 1988