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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 190 TO FACILITY OPERATING LICENSE NPF-9

AND AMENDMENT NO. 171 TO FACILITY OPERATING LICENSE NPF-17

DUKE ENERGY CORPORATION

MCGUIRE NUCLEAR STATION, UNITS 1 AND 2

DOCKET NOS. 50-369 AND 50-370

1.0 INTRODUCTION

By letter dated October 15, 1999, Duke Energy Corporation (the licensee) submitted for staff review and approval a proposed amendment to the Catawba and McGuire Technical Specifications (TS). The amendment would change Section 5.5.7, "Reactor Coolant Pump Flywheel Inspection Program." The subject issue had been addressed in the Westinghouse topical report, WCAP-14535A, "Topical Report on Reactor Coolant Pump Flywheel Inspection Elimination," which was approved by the Nuclear Regulatory Commission (NRC) with certain conditions. These conditions are specified in the Safety Evaluation (SE) dated September 12, 1996, for WCAP-14535A. The licensee intended to apply this topical report to Catawba, Units 1 and 2, and McGuire, Units 1 and 2, and change their reactor coolant pump (RCP) flywheels inspection intervals in accordance with the conclusion of the SE on WCAP-14535A.

The function of the RCP in the reactor coolant system (RCS) of a pressurized water reactor (PWR) plant is to maintain an adequate coolant flow rate by circulating a large volume of primary coolant water at high temperature and pressure through the RCS. A concern regarding overspeed of the RCP and its potential for failure led to the issuance of Regulatory Guide (RG) 1.14 in 1971. Since then, all licensees for PWR plants, with very few exceptions, have adopted the guidelines of RG 1.14 to conduct their RCP flywheel examinations. These requirements are normally specified in the individual plant's TS as is the case for Catawba, Units 1 and 2, and McGuire, Units 1 and 2.

2.0 EVALUATION

2.1 New Paragraph to TS Section 5.5.7

The existing single paragraph of Section 5.5.7 requires that inspection of each RCP flywheel be done per the recommendations of Regulatory Position C.4.b of RG 1.14. The licensee proposed to revise Catawba and McGuire TS Section 5.5.7 by adding a new paragraph which reads:

> In lieu of Position C.4.b(1) and C.4.b(2), a qualified in-place UT examination over the volume from the inner bore of the flywheel to the circle one-half of the outer radius or a surface examination (MT and/or PT) of exposed surfaces of the removed flywheels may

be conducted at approximately 10 year intervals coinciding with the Inservice Inspection schedule as required by ASME Section XI.

In the SE on Westinghouse topical report WCAP-14535A, the staff stated that the evaluation methodology for RCP flywheels in WCAP-14535A is appropriate and the criteria are in accordance with the design criteria of RG 1.14. In addition, the staff specified:

(1) Licensees who plan to submit a plant-specific application of this topical report for flywheels made of SA 533 B material need to confirm that their flywheels are made of SA 533 B material. Further, licensees having Group-15 flywheels need to demonstrate that the material properties of their A516 material are equivalent to SA 533 B material, and its reference temperature, RT_{NDT}, is less than 30°F.

(2) Licensees who plan to submit a plant-specific application of this topical report for their flywheels not made of SA 533 B or A516 material need to either demonstrate that their flywheel material properties are bounded by those of SA 533 B material, or provide the minimum specified ultimate tensile stress, S_U, the fracture toughness, K_{IC}, and the reference temperature, RT_{NDT}, for that material. For the latter, the licensees should employ these material specific properties, and use the methodology in the topical report, as extended in the two responses to the staff's request for additional information (RAI), to provide an assessment to justify a change in inspection schedules for their plants.

(3) Licensees meeting either (1) or (2) above should either conduct a qualified in-place ultrasonic testing (UT) examination of the volume from the inner bore of the flywheel to the circle of one-half the outer radius or conduct a surface examination (MT and/or PT) of exposed surfaces defined by the volume of the disassembled flywheels once every 10 years. The staff considers this 10-year inspection requirement not burdensome when the flywheel inspection is conducted during scheduled ISI inspection or RCP motor maintenance. This would provide an appropriate level of defense in depth.

Further, the staff required:

Licensees with Group-10 flywheels need to confirm in the near term that their flywheels have an adequate shrink fit of the flywheel at the maximum overspeed.

The licensee confirmed in its application for amendment that the flywheels for Catawba, Units 1 and 2, and McGuire, Units 1 and 2, are made of SA 533 B material. Hence, only (1) and (3) apply. The staff further verified that the flywheels for Catawba, Units 1 and 2, and McGuire, Units 1 and 2, do not belong to either Group 10 or Group 15 flywheels, for which additional analyses need to be performed. Therefore, the plant-specific applicability of WCAP-14535A to Catawba, Units 1 and 2, and McGuire, Units 1 and 2, has been established, and the 10-year inspection requirement with details specified in (3) is acceptable. The staff has determined that the analysis in the Westinghouse topical report WCAP-14535A is applicable to Catawba, Units 1 and 2, and McGuire, Units 1 and 2. Hence, the staff accepts the licensee's proposed changes, i.e.,10-year inspection intervals for RCP flywheels, in accordance with (3) above, to TS Section 5.5.7 for all four units.

3.0 STATE CONSULTATION

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

4.0 ENVIRONMENTAL CONSIDERATION

The amendments change requirements with respect to inspection or surveillance of a facility component located within the restricted area as defined in 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 staff has previously issued a proposed finding that the amendments involve no significant hazards consideration, and there has been no public comment on such finding (64 FR 62706 dated November 17, 1999). Accordingly, the revisions of TS Section 3.3.2 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.

5.0 CONCLUSION

The staff 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.

Principal Contributor: S. Sheng

Date: December 21, 1999