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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 51 TO FACILITY OPERATING LICENSE NPF-9

AND AMENDMENT NO. 32 TO FACILITY OPERATING LICENSE NPF-17

DUKE POWER COMPANY

McGUIRE NUCLEAR STATION, UNITS 1 AND 2

INTRODUCTION

By letters dated August 20, and November 6, 1985, and January 28, 1986, Duke Power Company (the licensee) proposed amendments to the operating licenses for McGuire Nuclear Station, Units 1 and 2, which would change the Technical Specifications 3.6.1.2 to increase by 50% the allowed containment overall integrated leakage rate. By letter dated April 25, 1985, the licensee proposed amendments, in part, to change Technical Specification 6.10 so as to provide for retention of records of QA activities in accordance with the retention periods specified in ANSI N45.2.9-1974, "Requirements for Collection, Storage, and Maintenance of Quality Assurance Records for Nuclear Power Plants." By letter dated September 6, 1985, the licensee proposed amendments to add requirements to the Technical Specifications for existing engineered safety features actuation instrumentation which detects accumulation of water in the doghouse and provides a feedwater isolation signal if a high doghouse water level (indicative of a feedwater line break) is reached. The NRC staff has evaluated these proposed amendments.

EVALUATION

1. Containment Integrated Leakage Rate

These amendments increase the containment overall integrated leakage rate in Technical Specification 3.6.1.2 from its previous L_a value of 0.20% per day to 0.30% per day. (L_a is as defined in Appendix J to 10 CFR 50, corresponding at McGuire to a containment pressure of 14.8 psig). The licensee's initial request of August 20, 1985, also proposed changes to L_t (also defined in Appendix J) which were subsequently withdrawn by letter dated January 28, 1986, and are not included in these amendments.

While this change would generally increase the doses estimated under accident conditions, the licensee has shown that by taking credit for the existing containment spray iodine removal system, the dose guidelines as specified in 10 CFR 100 and General Design Criterion-19 would not be exceeded. By its letter of August 20, 1985, the licensee provided revised radiation exposure calculations for a design basis LOCA using the methodology from Revision 1 of the Standard Review Plan (SRP), Section 6.5.2. SRP Section 6.5.2 recognizes that containment spray systems with boric acid spray solutions have been shown to be effective for removal of elemental and particulate iodine. This permits the licensee to take credit for the iodine removal effect of the boric acid which is contained in containment spray water for other reasons. Details of the analytical model and parameters used as input for these calculations are further identified by the licensee's letter of November 6, 1985. The revised analyses demonstrate for thyroid doses that the proposed 50% increase in the containment leakage rate is nearly offset by the effect of the spray system. Since noble gases are unaffected by containment sprays, the increased containment leakage rate results in increased whole body and skin doses. However, for the McGuire Nuclear Station, thyroid radiation exposure is the limiting criterion, and the licensee's calculations show that the whole body and skin doses remain well below the acceptance criteria in Appendix A of SRP Section 15.6.5 for offsite exposure (i.e., 10 CFR 100.11 values) and acceptance criteria in SRP 6.4 (i.e., GDC 19) for control room personnel. The previous and revised results calculated by the licensee and the appropriate criteria are:

	Onsite Dose (Rem)			Offsite Dose (Rem)			
	Inside Control Room			Exclusion Area Boundary		Low Population Zone	
	Whole Body	Skin	Thyroid	Whole Body	Thyroid	Whole Body	Thyroid
Current Values	0.2	4	26	3	198	0.6	65
Revised Values	0.3	6	19	4	208	0.7	51
Allowable Limits	5	30	30	25	300	25	300

In response to the licensee's request for amendments, the NRC staff reviewed the licensee's analyses, and also performed its own independent offsite LOCA dose analyses. Our analyses, like those by the licensee, used the standard assumptions as specified in Regulatory Guide 1.4 for the radiological source term. We assumed the spray water to be borated, but to contain no additive to bring the spray pH to a high elemental iodine removal capability as indicated in SRP 6.5.2. (This latter assumption is conservative since the system design does provide for spray pH control, and the licensee assumed a spray pH of 8.5 based upon Technical Specification 3/4.6.5.1). Using the partition coefficient guidance of SRP 6.5.2, our independent assessment utilized a maximum partition coefficient for elemental iodine of 50 rather than the licensee's value of 5.5. The offsite doses we calculated for a containment leak rate of 0.3%/day are:

	Whole Body (Rem)	Thyroid (Rem)
Exclusion Area Boundary	3.5	223
Low Population Zone	0.5	33

We examined the difference between our calculated offsite doses and those by the licensee. We find the variations to result from differences in the analytical models (i.e., unlike the licensee's model, our model provides for differentation between the duration for removal of elemental iodine and the duration for removal of particulate iodines), and from differences in input assumptions (i.e., differences assumed for frequency and duration of cycling of the containment annulus filtered ventilation exhaust system, and differences in assumed values for iodine removal coefficients stemming from spray pH assumptions discussed above). However, the differences in calculated results are somewhat academic because the results calculated by both the licensee and NRC are within allowable limits and are, therefore, acceptable.

For onsite doses, we examined the analyses and consequences of the increased containment leak rate on control room personnel as calculated by the licensee and concluded that the habitability systems for the shared control room are such that the doses meet the guidelines of GDC-19.

On the basis of our review and independent calculations, we find the licensee's revised analyses which reflect credit for the containment spray system to be consistent with SRP 6.5.2 and to result in doses within the guidelines of 10 CFR 100 and the requirements of GDC-19. The requested revision to Technical Specification 3.6.1.2 is, therefore, acceptable.

2. Records Retention

These amendments change the record retention period in Technical Specification 6.10 for records of quality assurance activities required by the QA Manual. Specification 6.10.2i previously required that these records be retained for the duration of the Operating License. The change substitutes a new Specification 6.10.3 requiring that these records be retained for the period specified by ANSI N45.2.9-1974, "Requirements for Collection, Storage, and Maintenance of Quality Assurance Records for Nuclear Power Plants."

ANSI N45.2.9-1974 provides a list of the various types of QA records and divides them into "Lifetime" and "Nonpermanent" categories for retention period purposes. For each record type in the "Nonpermanent" category, ANSI N45.2.9-1974 designates a specific minimum retention period ranging from 0 to 6 years. As stated in Regulatory Guide 1.88, the requirements and guidelines for collection, storage and maintenance of quality assurance records that are included in ANSI N45.2.9-1974 are acceptable to the NRC staff and provide an adequate basis for complying with the pertinent quality assurance requirements for Appendix B to 10 CFR Part 50.

The change involves only the substitution of a more specific and more appropriate requirement for QA records retention pursuant to a standard accepted by the NRC staff. Because this substitution would not shorten the retention period for those types of QA records which the Commission has determined should be retained for the plant lifetime, and does appropriately recognize that some of the QA record types have limited significance and may be retained for lesser periods, the change has no adverse impact on safety and is, therefore, acceptable.

3. Doghouse Water Level Instrumentation

These amendments add limiting conditions for operation and surveillance requirements for existing engineered safety features actuation instrumentation which detects accumulation of water in the doghouse and provides a feedwater isolation signal if a high doghouse water level (indicative of a feedwater line break) is reached.

Technical Specification 3.3.2 requires, as a limiting condition for operation, that the engineered safety features actuation system instrumentation channels shown in Table 3.3-3 be operable, and that their trip setpoints be set consistent with values in Table 3.3-4. The change supplements Specification Table 3.3-4 to reflect the high doghouse water level trip setpoint (12") and associated allowable value (13"). Specification Table 3.3-3 is supplemented to reflect the total number of channels (3/train/doghouse), minimum channels operable (2/train/doghouse), and applicable modes (power operation and startup). The change to Table 3.3-3 also adds required action in the event of an inoperable train(s) (i.e., with one of the two trains of doghouse water level instrumentation inoperable (less than the minimum required number of channels operable), restore the inoperable train to operable status in 72 hours. After 72 hours with one train inoperable, or within one hour with 2 trains inoperable, monitor doghouse water level in the affected doghouse continuously until both trains are restored to operable status.) The change also supplements the surveillance requirements of Table 4.3-2 to require a channel check once per shift and a trip actuating device operational check once per 18 months.

The change corrects a deficiency stemming from the absense of any surveillance requirements or limiting conditions for operation within the Technical Specifications with respect to this existing instrumentation. Such requirements are appropriate for this engineered safety feature actuation instrumentation to provide proper levels of assurance of operability. The NRC staff has reviewed the description of this instrumentation design as contained in the licensee's letter of September 6, 1985, and finds it to be consistent with the logic, setpoints and allowable values added to Specification Tables 3.3-3 and 3.3-4. The staff also reviewed the action statements for an inoperable train and the surveillance requirements added to Table 4.3-2 and finds them appropriate in view of this instrumentation's importance to safety. We conclude, therefore, that these changes provide additional restrictions and surveillances during operation where none would otherwise exist in the technical specifications, and that because this instrumentation provides for accomplishment of a safety related function, such restrictions and surveillances are appropriate. The changes are consistent with the instrumentation design and will provide no adverse impact on safety. Therefore, these changes are acceptable.

ENVIRONMENTAL CONSIDERATION

These amendments involve changes to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and in surveillance requirements, and changes in recordkeeping requirements. We have determined that 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 radiation exposure. The NRC staff has made a proposed determination that the amendments involve no significant hazards consideration, and there has been no public comment on such finding. Accordingly, the amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9) and (10). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of these amendments.

CONCLUSION

The Commission made proposed determinations that the amendments involve no significant hazards considerations which were published in the Federal Register (51 FR 3715) on January 29, 1986, (50 FR 51621) on December 18, 1985, and (50 FR 53232) on December 30, 1985, and 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.

Principal Contributors: Darl S. Hood, PWR #4 PWR Licensing-A
F. Burrows, Electrical, Instrumentation and Control Systems Branch
H. Gilpin, Accident Evaluation Branch

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AMENDMENT NO. 51 TO FACILITY OPERATING LICENSE NPF-9 - McGuire Nuclear Station, Unit 1
AMENDMENT NO. 32 TO FACILITY OPERATING LICENSE NPF-17 - McGuire Nuclear Station, Unit 2

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