February 1, 1996

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Mr. T. C. McMeekin
Vice President, McGuire Site
Duke Power Company
12700 Hagers Ferry Road
Huntersville, NC 28078-8985

SUBJECT: ISSUANCE OF AMENDMENTS - McGUIRE NUCLEAR STATION, UNITS 1 AND 2 (TAC NOS. M84573 AND M84574)

Dear Mr. McMeekin:

The Nuclear Regulatory Commission has issued the enclosed Amendment No. 163 to Facility Operating License NPF-9 and Amendment No. 145 to Facility Operating License NPF-17 for the McGuire Nuclear Station, Units 1 and 2. The amendments consist of changes to the Technical Specifications (TS) in response to your application dated August 20, 1992, as supplemented by letter dated December 5, 1995.

The amendments revise the TS related to the 60-month 125-volt battery surveillance requirement (SR). The proposed change is to delete the words "during shutdown" from SR 4.8.2.1.2.e (Performance Discharge Test).

A copy of the related Safety Evaluation is also enclosed. A Notice of Issuance will be included in the Commission's biweekly Federal Register notice.

Sincerely,
Original signed by:

Victor Nerses, Senior Project Manager
Project Directorate II-2
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Docket Nos. 50-369 and 50-370

Enclosures:
1. Amendment No. 163 to NPF-9
2. Amendment No. 145 to NPF-17
3. Safety Evaluation

cc w/encl: See next page

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

February 1, 1996

Mr. T. C. McMeekin
Vice President, McGuire Site
Duke Power Company
12700 Hagers Ferry Road
Huntersville, NC 28078-8985

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Victor Nerses, Senior Project Manager
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cc w/encl: See next page

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

DUKE POWER COMPANY

DOCKET NO. 50-369

McGUIRE NUCLEAR STATION, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 163
License No. NPF-9

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment to the McGuire Nuclear Station, Unit 1 (the facility), Facility Operating License No. NPF-9 filed by the Duke Power Company (licensee) dated August 20, 1992, as supplemented by letter dated December 5, 1995, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations as set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations set forth in 10 CFR Chapter I;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is hereby amended by page changes to the Technical Specifications as indicated in the attachment to this license amendment, and Paragraph 2.C.(2) of Facility Operating License No. NPF-9 is hereby amended to read as follows:

Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 163 , are hereby incorporated into this license. The licensee shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of its date of issuance and shall be implemented within 30 days from the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Robert Martin

Herbert N. Berkow, Director
Project Directorate II-2
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Attachment:
Technical Specification
Changes

Date of Issuance: February 1, 1996

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

DUKE POWER COMPANY

DOCKET NO. 50-370

McGUIRE NUCLEAR STATION, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 145
License No. NPF-17

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment to the McGuire Nuclear Station, Unit 2 (the facility), Facility Operating License No. NPF-17 filed by the Duke Power Company (licensee) dated August 20, 1992, as supplemented by letter dated December 5, 1995, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations as set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations set forth in 10 CFR Chapter I;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is hereby amended by page changes to the Technical Specifications as indicated in the attachment to this license amendment, and Paragraph 2.C.(2) of Facility Operating License No. NPF-17 is hereby amended to read as follows:

Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 145 , are hereby incorporated into this license. The licensee shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of its date of issuance and shall be implemented within 30 days from the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Robert Martin for

Herbert N. Berkow, Director
Project Directorate II-2
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Attachment:
Technical Specification
Changes

Date of Issuance: February 1, 1996

ATTACHMENT TO LICENSE AMENDMENT NO. 163

FACILITY OPERATING LICENSE NO. NPF-9

DOCKET NO. 50-369

AND

TO LICENSE AMENDMENT NO. 145

FACILITY OPERATING LICENSE NO. NPF-17

DOCKET NO. 50-370

Replace the following pages of the Appendix "A" Technical Specifications with the enclosed pages. The revised pages are identified by Amendment number and contain vertical lines indicating the areas of change.

| Remove Pages | Insert Pages |
|---|---|
| 3/4 8-13 | 3/4 8-13 |
| B 3/4 8-2 | B 3/4 8-2 |

SURVEILLANCE REQUIREMENTS (Continued)

d. At least once per 18 months by verifying that the battery capacity is adequate to either:

   1) Supply and maintain in OPERABLE status all of the actual emergency loads for 1 hour when the battery is subjected to a battery service test, or

   2) Supply a dummy load of greater than or equal to 440 amperes for 60 minutes while maintaining the battery terminal voltage greater than or equal to 105 volts.

e. At least once per 60 months by verifying that the battery capacity is at least 80% of the manufacturer's rating when subjected to a performance discharge test. Once per 60-month interval, this performance discharge test may be performed in lieu of the battery service test required by Specification 4.8.2.1.2d.

f. Annual performance discharge tests of battery capacity shall be given to any battery that shows signs of degradation or has reached 85% of the service life expected for the application. Degradation is indicated when the battery capacity drops more than 10% of rated capacity from its average on previous performance tests, or is below 80% of the manufacturer's rating.

BASES

A.C. SOURCES, D.C. SOURCES AND ONSITE POWER DISTRIBUTION SYSTEMS (Continued)

The Surveillance Requirement for demonstrating the OPERABILITY of the station batteries are based on the recommendations of Regulatory Guide 1.129, "Maintenance Testing and Replacement of Large Lead Storage Batteries for Nuclear Power Plants," February 1978, and IEEE Std 450-1980, "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Large Lead Storage Batteries for Generating Stations and Substations."

In SURVEILLANCE 4.8.2.1.2.e, after the battery is returned to service (re-connected to and supplying its normal DC distribution center) following a performance discharge test (PDT), no discharge testing shall be done within 10 days on the other three batteries. This is a conservative measure to ensure the tested battery is fully charged. This restriction is an interim measure until the concern regarding recovered battery capacity immediately following recharging is resolved.

Verifying average electrolyte temperature above the minimum for which the battery was sized, total battery terminal voltage onfloat charge, connection resistance values and the performance of battery service and discharge tests ensures the effectiveness of the charging system, the ability to handle high discharge rates and compares the battery capacity at that time with the rated capacity.

Table 4.8-3 specifies the normal limits for each designated pilot cell and each connected cell for electrolyte level, float voltage and specific gravity. The limits for the designated pilot cells float voltage and specific gravity, greater than 2.13 volts and 0.015 below the manufacturer's full charge specific gravity or a battery charger current that had stabilized at a low value, is characteristic of a charged cell with adequate capacity. The normal limits for each connected cell for float voltage and specific gravity, greater than 2.13 volts and not more than 0.020 below the manufacturer's full charge specific gravity with an average specific gravity of all the connected cells not more than 0.010 below the manufacturer's full charge specific gravity, ensures the OPERABILITY and capability of the battery.

Operation with a battery cell's parameter outside the normal limit but within the allowable value specified in Table 4.8-3 is permitted for up to 7 days. During this 7-day period: (1) the allowable values for electrolyte level ensures no physical damage to the plates with an adequate electron transfer capability; (2) the allowable value for the average specific gravity of all the cells, not more than 0.020 below the manufacturer's recommended full charge specific gravity, ensures that the decrease in rating will be less than the safety margin provided in sizing; (3) the allowable value for an individual cell's specific gravity, ensures that an individual cell's specific gravity will not be more than 0.040 below the manufacturer's full charge specific gravity and that the overall capability of the battery will be maintained within an acceptable limit; and (4) the allowable value for an individual cell's float voltage, greater than 2.07 volts, ensures the battery's capability to perform its design function.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 163 TO FACILITY OPERATING LICENSE NPF-9

AND AMENDMENT NO. 145 TO FACILITY OPERATING LICENSE NPF-17

DUKE POWER COMPANY

MCGUIRE NUCLEAR STATION, UNITS 1 AND 2

DOCKET NOS. 50-369 AND 50-370

## 1.0 BACKGROUND

By letter of August 20, 1992, as supplemented by letter dated December 5, 1995, Duke Power Company (DPC or the licensee) submitted a request for changes to the McGuire Nuclear Station, Units 1 and 2, Technical Specifications (TS). The requested changes would revise the TS for the 125-volt battery Surveillance Requirement (SR). The proposed amendments delete the words "during shutdown" from SR 4.8.2.1.2.e, which requires that each battery be subjected to a performance discharge test (PDT) during shutdown at least once per 60 months. The PDT is a constant current capacity test for a battery to detect any change in the battery capacity after being in service and the PDT is performed regularly to verify that the battery capacity is at least 80 percent of the manufacturer's rating. The licensee finds that performing the battery PDT during shutdown in accordance with SR 4.8.2.1.2.e is impractical because it requires shutdown of both McGuire units.

## 2.0 EVALUATION

The purpose of the dc power system in nuclear power plants is to provide control and motive power to valves, instrumentation, emergency diesel generators, and many other components and systems during all phases of plant operation, including abnormal shutdown and accident situations. The failure of dc power supplies could result in a loss of shutdown cooling capability which, in turn, could increase the probability of core damage. Since a single failure of any dc component (e.g., dc bus, battery, and battery charger) in one unit could affect the dc system from performing its intended safety function of the other unit, the current dc power system design in multi-units does not allow for sharing. In addition, the AOT for an inoperable dc component in the current version of the standard TS allows power operation to continue only for two hours. With the two hour AOT, most licensees find that the battery PDT needs to be performed when the unit is shut down.

2.1 Deletion of the Words "During Shutdown" From TS SR 4.8.2.1.2.e

The licensee proposes to delete the words "during shutdown" from SR 4.8.2.1.2.e, which states that:

> At least once per 60 months, during shutdown, by verifying that the battery capacity is at least 80 percent of the manufacturer's rating when subjected to a performance discharge test. Once per 60-month interval, this performance discharge test may be performed in lieu of the battery service test required by Specification 4.8.2.1.2.d.

With one battery and/or battery charger inoperable, Action Statement b.2 of LCO 3.8.2.1 in the current McGuire TS allows unit operation to be continued for up to 72 hours, as long as the associated bus is energized with an operable battery bank via operable tie breakers within two hours. With a 1-hour discharge rate of 758 amps and an accelerated recharge procedure used for the test, the licensee finds that the PDT can be conducted and the battery can be fully recharged within the 72-hour AOT. Therefore, the licensee believes that there is no reason that SR 4.8.2.1.2.e should be performed only during the shutdown of both units.

The licensee has reviewed the design of the 125-volt dc power system, the current TS provisions, and pertinent regulatory guides (RGs) applicable to the McGuire licensing basis and finds that:

1. The 125-volt dc system at McGuire has been designed as a "shared system" by having four batteries, chargers, and distribution centers (EVDA, EVDB, EVDC, and EVDD) that serve two units. A dedicated battery and chargers are connected to each distribution center, which in turn feeds power to the two dc power panel boards and two static inverters for both units. The loads served from four distribution centers are all safety-related and unitized; one group, consisting of a dc panel board and an inverter, serves Unit 1, and another group serves Unit 2. These unitized panel boards allow independence and separation between the engineered safety feature (ESF) loads for each unit.

2. Two distribution centers (EVDA and EVDC) can be tied together since they are of the same train (i.e., Train A). Likewise, distribution centers (EVDB and EVDD) can be tied together because they are of the same train (i.e., Train B). For the removal of a battery and its associated charger for maintenance or testing, a spare (the fifth) battery charger has been provided to replace the associated battery charger by closing appropriate key interlock circuit breakers. This alignment is controlled by approved procedures. Therefore, train redundancy is maintained at all times.

3. Each train has two batteries, and each battery is sized to carry the accident loads of one unit plus the safe shutdown of the other unit for one complete train, assuming a loss of offsite power. Coordination also exists such that a fault at the system level on the non-accident unit will not affect the ability to supply ESF loads to the non-accident unit and safely shutdown the other unit in the event of a loss of offsite power.

4. In the 1977 edition of RG 1.32, "Criteria for Safety-Related Electric Power Systems for Nuclear Power Plants," position C.2.a states that shared electric systems for multi-unit stations are unacceptable except as specified in RG 1.81, "Shared Emergency and Shutdown Electric Systems for Multi-Unit Nuclear Power Plants." However, for multi-unit plants under construction with permit applications prior to June 1, 1973, position C.2 of RG 1.81 permitted the staff to review each request on an individual case basis.

5. Because the McGuire construction permit was granted on February 28, 1973, the McGuire's shared dc system is committed to the earlier RG 1.32, Rev. 0, 1972. RG 1.81 is not in the McGuire licensing basis.

6. Nevertheless, the concern about sharing the 125-volt dc system between the units at McGuire with respect to position C.2 of RG 1.81 was identified as an open item in the original Safety Evaluation Report (SER). Subsequently, the staff sought additional information. The staff closed this issue in Supplement 1 of the SER in 1978.

On the basis of the above information, the licensee states that the 125-volt dc shared system design at McGuire is not only permitted by the licensing basis but also is not vulnerable to a single failure because of the additional battery capacity and train redundancy. The licensee further states that even during a 72-hour AOT, the single failure of any components of either train (including an emergency diesel generator) will still leave a full capacity train available to provide vital instrumentation and control power for both units. Therefore, the staff finds that a battery can safely be removed from service for the purpose of performing the PDT for the battery without presenting appreciable risk. On this basis, the staff concludes that the proposed removal of the words "during shutdown" from SR 4.8.2.1.2.e is acceptable.

However, during the review of the amendment, the staff found that McGuire's square cell batteries have been replaced with new AT&T round cell batteries. With new AT&T round cell batteries installed, the staff has raised the following two TS concerns:

1. Adequacy of the 72-hour AOT following a PDT (deep discharging) to restore or return the battery capacity to its pre-test condition.

2. Because the capacity of new AT&T round cells would not drop below published rates for the guaranteed life of the cell as their capacity increases with age, the staff believes that the battery replacement (SR 4.8.2.1.2.e) and degradation (SR 4.8.2.1.2.f) criteria in the TS should be modified to reflect its consistency with other operating plants (e.g., Palo Verde, Byron, and Braidwood), which installed the AT&T round cells of the same design.

To resolve these concerns, the licensee committed to interact with the battery vendor to determine how long the battery will take to recover its capacity immediately following the PDT; the licensee also committed to interact with appropriate industry groups to resolve the battery replacement and degradation

criteria for the AT&T round cells. The licensee will provide an update on this issue to NRC by June 30, 1996, and periodically thereafter.

Until the issue regarding recovered battery capacity after PDT is resolved, the licensee, as an interim measure, has proposed that no discharge test shall be performed within 10 days on the remaining three batteries to ensure the tested battery is fully charged, and this commitment is reflected in the TS 3/4.8.2 BASES section by adding the following paragraph:

> In SURVEILLANCE 4.8.2.1.2.e, after the battery is returned to service (re-connected to and supplying its normal DC distribution center) following a performance discharge tests (PDT), no discharge testing shall be done within 10 days on the other three batteries. This is a conservative measure to ensure the tested battery is fully charged. This restriction is an interim measure until the concern regarding recovered battery capacity immediately following recharging is resolved.

The staff has reviewed the above compensatory action and finds it prudent and acceptable. When the battery recharging issue is resolved, the above paragraph should be removed from the Bases section.

## 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 surveillance requirements. 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 (60 FR 65677 dated December 20, 1995). 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.

## 5.0 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.

Principal Contributor: P. Kang

Date: February 1, 1996