

July 1, 1991

Docket Nos. 50-369  
and 50-370

Distribution  
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Mr. M.S. Tuckman  
Vice President -  
Nuclear Operations  
Duke Power Company  
P.O. Box 1007  
Charlotte, North Carolina 28201-1007

Dear Mr. Tuckman:

SUBJECT: ISSUANCE OF AMENDMENT NO. 121 TO FACILITY OPERATING LICENSE NPF-9 AND  
AMENDMENT NO. 103 TO FACILITY OPERATING LICENSE NPF-17 - MCGUIRE  
NUCLEAR STATION, UNITS 1 AND 2 (TACS 80148/80149)

The Nuclear Regulatory Commission has issued the enclosed Amendment No. 121 to Facility Operating License NPF-9 and Amendment No. 103 to Facility Operating License NPF-17 for the McGuire Nuclear Station, Units 1 and 2. These amendments consist of changes to the Technical Specifications (TSs) in response to your application dated April 16, 1991.

The amendments are a one-time only change to enable replacement of the existing 125 volt DC battery cells with new cells.

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

Sincerely,



Timothy A. Reed, Project Manager  
Project Directorate II-3  
Division of Reactor Projects I/II

Enclosures:

1. Amendment No. 121 to NPF-9
2. Amendment No. 103 to NPF-17
3. Safety Evaluation

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

July 1, 1991

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Sincerely,

A handwritten signature in dark ink, appearing to read "Timothy A. Reed", is written over a circular stamp or seal.

Timothy A. Reed, Project Manager  
Project Directorate II-3  
Division of Reactor Projects I/II  
Office of Nuclear Reactor Regulation

Enclosures:

1. Amendment No. 121 to NPF-9
2. Amendment No. 103 to NPF-17
3. Safety Evaluation

cc w/enclosures:  
See next page

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Duke Power Company

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

DUKE POWER COMPANY

DOCKET NO. 50-369

McGUIRE NUCLEAR STATION, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 121  
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 (the licensee) dated April 16, 1991, 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. 121, are hereby incorporated into the 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.

FOR THE NUCLEAR REGULATORY COMMISSION



David B. Matthews, Director  
Project Directorate II-3  
Division of Reactor Projects-I/II  
Office of Nuclear Reactor Regulation

Attachment:  
Technical Specification  
Changes

Date of Issuance: July 1, 1991



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

DUKE POWER COMPANY

DOCKET NO. 50-370

McGUIRE NUCLEAR STATION, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 103  
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 (the licensee) dated April 16, 1991, 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. 103, are hereby incorporated into the 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.

FOR THE NUCLEAR REGULATORY COMMISSION



David B. Matthews, Director  
Project Directorate II-3  
Division of Reactor Projects-I/II  
Office of Nuclear Reactor Regulation

Attachment:  
Technical Specification  
Changes

Date of Issuance: July 1, 1991

ATTACHMENT TO LICENSE AMENDMENT NO. 121

FACILITY OPERATING LICENSE NO. NPF-9

DOCKET NO. 50-369

AND

TO LICENSE AMENDMENT NO. 103

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

3/4 8-11  
3/4 8-12  
3/4 8-13  
3/4 8-14  
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Insert Pages

3/4 8-11  
3/4 8-12  
3/4 8-13  
3/4 8-14  
3/4 8-14a

## ELECTRICAL POWER SYSTEMS

### 3/4.8.2 D.C. SOURCES

#### OPERATING

#### LIMITING CONDITION FOR OPERATION

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3.8.2.1 The following D.C. channels shall be OPERABLE and energized:

- a. Channel 1 consisting of 125-Volt D.C. Bus No. EVDA, 125-Volt D.C. Battery Bank No. EVCA and a full-capacity charger,\*#
- b. Channel 2 consisting of 125-Volt D.C. Bus No. EVDB, 125-Volt D.C. Battery Bank No. EVCB and a full-capacity charger,\*#
- c. Channel 3 consisting of 125-Volt D.C. Bus No. EVDC, 125-Volt D.C. Battery Bank No. EVCC and a full-capacity charger,\*# and
- d. Channel 4 consisting of 125-Volt D.C. Bus No. EVDD, 125-Volt D.C. Battery Bank No. EVCD and a full-capacity charger,\*#

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTION: (Units 1 and 2)

- a. With one 125-volt D.C. bus inoperable or not energized, restore the inoperable bus to OPERABLE and energized status within 2 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.
- b. With one 125-volt D.C. battery and/or its normal and standby chargers inoperable or not energized, either:
  1. Restore the inoperable battery and/or charger to OPERABLE and energized status within 2 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours, or
  2. Energize the associated bus with an OPERABLE battery bank via OPERABLE tie breakers within 2 hours; operation may then continue for up to 72 hours from time of initial loss of OPERABILITY, otherwise, be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

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\*A vital bus may be disconnected from its D.C. source for up to 24 hours for the purpose of performing an equalizing charge on its associated battery bank provided the vital busses associated with the other battery banks are OPERABLE and energized.

#During periods of battery bank replacement only, the affected channel may be considered OPERABLE provided a temporary battery is configured to a full capacity charger and connected to the respective bus. All limiting conditions for operation, action statements, and surveillance requirements pertaining to the permanent batteries shall be maintained for the temporary battery during periods of battery bank replacement.

## ELECTRICAL POWER SYSTEMS

### SURVEILLANCE REQUIREMENTS

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4.8.2.1.1 Each D.C. channel shall be determined OPERABLE and energized with tie breakers open between redundant busses at least once per 7 days by verifying correct breaker alignment, indicated power availability from the charger and battery, and voltage on the bus of greater than or equal to 125 volts.

4.8.2.1.2 Each 125-volt battery bank and charger shall be demonstrated OPERABLE:

- a. At least once per 7 days:
  - 1) Verifying that the parameters in Table 4.8-3 meet the Category A limits, and
  - 2) Verifying total battery terminal voltage is greater than or equal to 125 volts on float charge.
- b. At least once per 92 days and within 7 days after a battery discharge (battery terminal voltage below 110 volts), or battery overcharge (battery terminal voltage above 150 volts), by:
  - 1) Verifying that the parameters in Table 4.8-3 meet the Category B limits,
  - 2) Verifying there is no visible corrosion at either terminals or connectors, or the connection resistance of these items is less than  $150 \times 10^{-6}$  ohms, and
  - 3) Verifying that the average electrolyte temperature of six connected cells is above 60°F.
- c. At least once per 18 months by verifying that:
  - 1) The cells, cell plates (if visible), and battery racks show no visual indication of physical damage or abnormal deterioration,
  - 2) The cell-to-cell and terminal connections are clean, tight, and coated with anti-corrosion material,
  - 3) The resistance of each cell-to-cell and terminal connection is less than or equal to  $150 \times 10^{-6}$  ohms, and
  - 4) The battery charger will supply at least 400 amperes at a minimum of 125 volts for at least 1 hour.

## ELECTRICAL POWER SYSTEMS

### SURVEILLANCE REQUIREMENTS (Continued)

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- 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, during shutdown, 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.

TABLE 4.8-3

BATTERY SURVEILLANCE REQUIREMENTS (Gould Cells)

PARAMETER	CATEGORY A <sup>(1)</sup>	CATEGORY B <sup>(2)</sup>	ALLOWABLE <sup>(3)</sup> VALUE FOR EACH CONNECTED CELL
	LIMITS FOR EACH DESIGNATED PILOT CELL	LIMITS FOR EACH CONNECTED CELL	
Electrolyte Level	>Minimum level indication mark, and $\leq \frac{1}{4}$ " above maximum level indication mark	>Minimum level indication mark, and $\leq \frac{1}{4}$ " above maximum level indication mark	Above top of plates, and not overflowing
Float Voltage	$\geq 2.13$ volts	$\geq 2.13$ volts <sup>(c)</sup>	$> 2.07$ volts
Specific Gravity <sup>(a)</sup>	$\geq 1.200$ <sup>(b)</sup>	$\geq 1.195$  Average of all connected cells $> 1.205$	Not more than .020 below the average of all connected cells or $\geq 1.195$  Average of all connected cells $\geq 1.195$ <sup>(b)</sup>

(a) Corrected for electrolyte temperature and level.

(b) Or battery charging current is less than 2 amps when on charge.

(c) Corrected for average electrolyte temperature.

(1) For any Category A parameter(s) outside the limit(s) shown, the battery may be considered OPERABLE provided that within 24 hours all the Category B measurements are taken and found to be within their allowable values, and provided all Category B parameter(s) are restored to within limits within the next 6 days.

(2) For any Category B parameter(s) outside the limit(s) shown, the battery may be considered OPERABLE provided that the Category B parameters are within their allowable values and provided the Category B parameter(s) are restored to within limits within 7 days.

(3) Any Category B parameter not within its allowable value indicates an inoperable battery.

TABLE 4.8-3 (continued)  
BATTERY SURVEILLANCE REQUIREMENTS (AT&T CELLS)

	Category A <sup>(1)</sup>		Category B <sup>(2)</sup>	Category C <sup>(3)</sup>
Parameter	Limits for each designated pilot cell		Limits for each connected cell	Allowable value for each connected cell
Electrolyte Level	> Minimum level indication mark, and $\leq 1/4$ " above maximum level indication mark		> Minimum level indication mark, and $\leq 1/4$ " above maximum level indication mark	Above top of plates, and not overflowing
Float Voltage	$\geq 2.20$ Volts		$\geq 2.17$ Volts <sup>(4)</sup>	$> 2.14$ Volts
Specific <sup>(5)</sup> Gravity	$\geq 1.285$ <sup>(6)</sup>	C E L L	$\geq 1.280$	Not more than 0.020 below the average of all connected cells or $\geq 1.280$
		B A T T E R Y	Average of all connected cells $> 1.285$ <sup>(7)</sup>	Average of all connected cells $> 1.280$ <sup>(6)(7)</sup>

- (1) For any Category A parameter(s) outside the limit(s) shown, the battery may be considered OPERABLE provided that within 24 hours, all the Category C measurements are taken and found to be within their allowable values. All Category B parameter(s) must be within limits in the next 6 days.
- (2) For any Category B parameter(s) outside the limit(s) shown, the battery may be considered OPERABLE provided that the Category C parameters are within their allowable values and provided the Category B parameter(s) are restored to within limits within 7 days.
- (3) Any Category C parameter not within its allowable value indicates an INOPERABLE battery.
- (4) Corrected for average electrolyte temperature.
- (5) Corrected for electrolyte temperature and level.
- (6) Or battery charging current is less than 2 amps when on float charge.
- (7) With no more than 5 cells at the minimum limit.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO AMENDMENT NO. 121 TO FACILITY OPERATING LICENSE NPF-9  
AND AMENDMENT NO. 103 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 INTRODUCTION

By letter dated April 16, 1991, the Duke Power Company (licensee) requested amendments to the Technical Specifications appended to Facility Operating License Nos. NPF-9 and NPF-17 for the McGuire Nuclear Station, Units 1 and 2. The proposed amendments are a one-time only change to enable replacement of the existing 125 volt DC battery cells with new cells.

McGuire is currently experiencing vital battery cell failures which are apparently related to normal aging and a condition of degradation called "oxide slough-off." This condition was diagnosed by the battery manufacturer (Gould) and is evidenced by a visible gray growth on the cell plates. This growth, along with normal sediment buildup, is causing a voltage reduction at the cell terminals of the affected cells. Another form of degradation is also developing on the vital batteries, evidenced by "flaking" of the plate hook area. This problem was identified during an inspection resulting from Information Notice 86-37, "Degradation of Station Batteries." The flaking on the battery cells at McGuire is mild and represents one of the most common failure mechanisms in lead-calcium batteries.

Because of visible degradation of each of the vital batteries, McGuire is now complying with the surveillance requirements of Technical Specification 4.8.2.1.2.f. This changes the battery capacity performance discharge test, normally conducted at least once per 60 months, to an annual interval. Results of the most recent performance testing (conducted during the first quarter of 1991) show all four vital batteries to be at or above 100% of manufacturer rating. It appears that any performance decrease as a result of detectable degradation of the cells is somewhat masked by the natural aging plate grid growth, resulting in a net capacity gain. As the cells age and approach the end of their design life, the capacity increases that are now seen will diminish at a much accelerated rate. At some point, these aging mechanisms will manifest into an unacceptable performance and possibly nonrecoverable cell failure.

McGuire has been forced to jumper out and replace individual cells that have either failed to perform during testing or fail to meet acceptance parameters of Technical Specifications. At present, McGuire has only seven spare cells

available. By letter dated April 16, 1991, Duke Power requested approval of a one-time change necessary to allow replacement of the existing 125V DC battery cells with new cells. While a battery bank is being replaced, a temporary battery bank will be installed so that the affected vital bus will remain battery-backed during the replacement period.

## 2.0 EVALUATION

The 125V DC system which is shared between the two McGuire units is divided into four independent and physically separated load groups, each load group being comprised of one battery, one battery charger, one DC distribution center, and two DC panel boards. The licensee has proposed to replace all the batteries, designated as EVCA, EVCB, EVCC, and EVCD.

The battery selected for replacement is the AT&T Lineage 2000 Round Cell battery. This battery is a secondary, lead-acid, flooded cell designed by AT&T Bell Laboratories. The licensee states that during the time period that the battery banks are being replaced, a temporary battery bank will be installed and connected to the affected 125 volt bus so that the bus remains battery backed at all times. The temporary battery bank will be located in Room 700 of the Service Building (Shared Load Center Room) and will be tied to the DC side of the standby battery charger EVCS via EVDS distribution center breaker 1B using temporary cable. Depending upon which battery bank is being replaced, the temporary battery will either be one of the AT&T banks that has not yet been installed as a replacement or a bank consisting of Gould cells that have been replaced. The standby charger/temporary battery combination will be connected to the affected 125 volt bus before its battery is disconnected for removal. The licensee will develop a temporary operating procedure for connecting the temporary battery to the affected vital bus and conduct all necessary training related to the procedure prior to the replacement of the first battery bank. In addition, the ambient temperature of the room containing the temporary battery will be periodically monitored by operations personnel to ensure that it remains within battery specifications. The ventilation in the area is sufficient to prevent accumulation of excess hydrogen.

If the temporary battery configuration should become degraded and incapable of fulfilling its intended function while a battery bank is being replaced, then the affected 125 volt channel will be declared inoperable and the normal limiting conditions for operation as stated in the Technical Specifications will apply. Should a battery become degraded, ACTION b.2. of Limiting Condition for Operation 3.8.2.1 allows the associated bus to be cross-tied to an operable battery bank within two hours. Operation in this configuration can then continue for up to 72 hours from the time of initial loss of operability. In addition, all 7-day surveillance requirements associated with the 125 volt channels will be performed for the temporary battery configuration to verify its operability while the temporary battery is being utilized during the periods of battery bank replacement.

The licensee has proposed to begin the replacement of battery bank EVCA on July 1, 1991. The total replacement operation for each battery bank will take 21 days. Following the replacement of EVCA, battery bank EVCC will be replaced beginning on August 1, 1991. Battery banks EVCB and EVCD will not be replaced until after the conclusion of the next Unit 2 refueling outage. This replacement is presently expected to begin in March 1992.

The licensee has proposed to modify Technical Specification 3/4.8.2 by placing an additional footnote after the existing footnote for items a through d. This additional footnote specifies that during periods of battery bank replacement only, the affected channel may be considered operable while the permanent battery is disconnected provided the temporary battery/charger configuration is connected to the respective vital bus. The licensee has proposed to use the standby battery charger EVCS in conjunction with the temporary battery. In the unforeseen event that the standby charger becomes unavailable, the normal charger for that channel will be utilized.

The replacement batteries will meet the QA requirements and will be seismically mounted. There is no change in the physical and electrical separation provisions for the batteries. During the replacement period, a safety-grade battery bank will be connected in place as a temporary replacement. The temporary battery will be installed in the Service Building which is not a Seismic Category I structure. The 125V DC vital power system will be restored to the fully qualified configuration following each three-week battery replacement period. Since, during each battery replacement period, the other three batteries and associated distribution equipment will remain in their normal configuration, the performance of their safety functions will not be degraded. Moreover, the ability to cross-tie the electrical buses for the batteries by manual action remains available as a backup in the event that the temporary battery is rendered unavailable during the replacement periods. Each battery is sized to carry the continuous emergency loads and anticipated momentary loads of its own vital buses, and assume the loads of another battery in a backup capacity for one hour. Technical Specification Limiting Condition for Operation 3.8.2.1 discusses the limitations for this configuration during normal operation. In addition, the licensee has committed to develop and implement the required procedures and training governing operation with the temporary battery in place prior to conducting battery replacement. During the period of battery replacement, if the temporary battery should become unavailable, then the affected 125 volt channel will be declared inoperable and the normal limiting conditions for operation will apply.

Based on the above, we conclude that the proposed change for these limited periods does not involve a significant reduction in any safety margin and is, therefore, acceptable.

We have reviewed the licensee's submittal and have concluded that the proposed Technical Specification change is a one-time only change necessary to allow replacement of the existing 125V DC battery cells with new cells, and while a battery bank is being replaced, a temporary battery bank will be installed so that the affected vital bus will remain battery-backed during the replacement period and that the proposed change does not involve a significant reduction in any safety margin and is, therefore, acceptable.

### 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

These amendments change requirements with respect to the installation or use of facility components located within the restricted area as defined in 10 CFR Part 20 and 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 (56 FR 22463). 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: N. K. Trehan, SELB/DST

Date: July 1, 1991

DATED: July 1, 1991

AMENDMENT NO. 121 TO FACILITY OPERATING LICENSE NPF-9 - McGuire Nuclear Station, Unit 1  
AMENDMENT NO. 103 TO FACILITY OPERATING LICENSE NPF-17 - McGuire Nuclear Station, Unit 2

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