

14, 1995

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

Distribution  
Docket File  
PUBLIC  
PDII-2 Reading  
S.Varga  
PA 0-17 F2  
OC/LFDCB T-9 E10  
E.Merschhoff, DRP/RII  
R.Crljenjak,RII  
D.Hagan T-4 A43  
G.Hill(4) T-5 C3  
C.Grimes 0-11 F23  
ACRS(4) T-2 E26  
OGC 0-15 B18

SUBJECT: ISSUANCE OF AMENDMENTS - McGUIRE NUCLEAR STATION, UNITS 1 AND 2  
(TAC NOS. M91615 AND M91616)

Dear Mr. McMeekin:

The Nuclear Regulatory Commission has issued the enclosed Amendment No.155 to Facility Operating License NPF-9 and Amendment No. 137 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 February 23, 1995, as supplemented by letter dated March 21, 1995.

The amendments revise TS 3.8.2.1 and TS 3.8.3.1 to allow installation of replacement equipment in response to an Electrical Distribution Systems Functional Inspection, conducted by the NRC in July 1991. The existing breaker arrangement could result in a trip of both the battery and main breakers if a fault occurs on one of the 125-V dc panelboards. You committed to have these breakers replaced in 1995 with a better coordinated design to eliminate the concern.

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. 155 to NPF-9
- 2. Amendment No. 137 to NPF-17
- 3. Safety Evaluation

cc w/encl: See next page

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**\*SEE PREVIOUS CONCURRENCE**

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NAME	LBerry		VNerses		CBerlinger		HBarkow
DATE	4/10/95		4/10/95		04/07/95	4/13/95	4/14/95

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1 14, 1995

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

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E.Merschhoff, DRP/RII

SUBJECT: ISSUANCE OF AMENDMENTS - McGUIRE NUCLEAR STATION, UNITS 1 AND 2  
(TAC NOS. M91615 AND M91616)

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The amendments revise TS 3.8.2.1 and TS 3.8.3.1 to allow installation of replacement equipment in response to an Electrical Distribution Systems Functional Inspection, conducted by the NRC in July 1991. The existing breaker arrangement could result in a trip of both the battery and main breakers if a fault occurs on one of the 125-V dc panelboards. You committed to have these breakers replaced in 1995 with a better coordinated design to eliminate the concern.

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

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DATE	4/10/95		4/10/95		04/07/95	4/13/95	4/14/95

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DOCUMENT NAME: G:\MCGUIRE\91615.AMD



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

April 14, 1995

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. M91615 AND M91616)

Dear Mr. McMeekin:

The Nuclear Regulatory Commission has issued the enclosed Amendment No. 155 to Facility Operating License NPF-9 and Amendment No. 137 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 February 23, 1995, as supplemented by letter dated March 21, 1995.

The amendments revise TS 3.8.2.1 and TS 3.8.3.1 to allow installation of replacement equipment in response to an Electrical Distribution Systems Functional Inspection, conducted by the NRC in July 1991. The existing breaker arrangement could result in a trip of both the battery and main breakers if a fault occurs on one of the 125-V dc panelboards. You committed to have these breakers replaced in 1995 with a better coordinated design to eliminate the concern.

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,

A handwritten signature in cursive script that reads "Victor Nerses".

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. 155 to NPF-9
2. Amendment No. 137 to NPF-17
3. Safety Evaluation

cc w/encl: See next page

Mr. T. C. McMeekin  
Duke Power Company

McGuire Nuclear Station

cc:

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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. 155  
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 February 23, 1995, as supplemented by letter dated March 21, 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.

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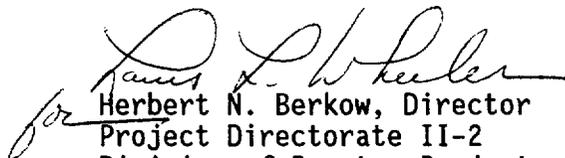
2. Accordingly, the license is hereby amended by page changes to the Technical Specifications as indicated in the attachment to this license amendment, and Paragraph 2.C.(2) of Facility Operating License No. NPF-9 is hereby amended to read as follows:

Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 155, 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

  
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: April 14, 1995



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. 137  
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 February 23, 1995, as supplemented by letter dated March 21, 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. 137, 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

  
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: April 14, 1995

ATTACHMENT TO LICENSE AMENDMENT NO. 155

FACILITY OPERATING LICENSE NO. NPF-9

DOCKET NO. 50-369

AND

TO LICENSE AMENDMENT NO. 137

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 8-16  
-

Insert Pages

3/4 8-11  
3/4 8/16  
3/4 8-16a\*

\*over flow page-no change

# ELECTRICAL POWER SYSTEMS

## 3/4.8.2 D.C. SOURCES

### OPERATING

#### LIMITING CONDITION FOR OPERATION

---

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.

---

\*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 station modification associated with battery, main and tie breaker replacement only, the loads of a DC bus may be energized from a same train DC bus via temporary cables and breakers connecting to the same train DC bus directly and bypassing the de-energized DC bus. A one time allowable outage time up to 112 hours is granted for each DC bus, one at a time, to allow for replacement of these breakers. Footnote \* shall not be applied to any of the busses during the 112 hour period.

## ELECTRICAL POWER SYSTEMS

### 3/4.8.3 ONSITE POWER DISTRIBUTION

#### OPERATING

#### LIMITING CONDITION FOR OPERATION

---

3.8.3.1 The following A.C. electrical busses and inverters shall be OPERABLE and energized with tie breakers open both between redundant busses within the unit and between the two units:

- a. 4160-Volt Emergency Bus ETA,
- b. 4160-Volt Emergency Bus ETB,
- c. 600-Volt Emergency Bus ELXA,
- d. 600-Volt Emergency Bus ELXB,
- e. 600-Volt Emergency Bus ELXC,
- f. 600-Volt Emergency Bus ELXD,
- g. 120-Volt A.C. Vital Bus EKVA energized from Inverter EVIA connected to D.C. Channel 1,\*#
- h. 120-Volt A.C. Vital Bus EKVB energized from Inverter EVIB connected to D.C. Channel 2,\*#
- i. 120-Volt A.C. Vital Bus EKVC energized from Inverter EVIC connected to D.C. Channel 3,\*# and
- j. 120-Volt A.C. Vital Bus EKVD energized from Inverter EVID connected to D.C. Channel 4.\*#

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

#### ACTION:

- a. With less than the above complement of A.C. busses OPERABLE and energized, restore the inoperable busses to OPERABLE and energized status within 8 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 inverter inoperable, energize the associated A.C. Vital Bus within 8 hours; restore the inoperable inverter to OPERABLE and energized status within 24 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

---

\*An inverter 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: (1) its vital bus is OPERABLE and energized, and (2) the vital busses associated with the other battery banks are OPERABLE and energized. An inverter may be disconnected from its D.C. source for up to 72 hours provided the conditions of ACTION b. of Specification 3.8.2.1 are satisfied.

#During periods of station modification associated with battery, main and tie breaker replacement only, two channel related inverters maybe eneregized from a same train DC bus via temporary cables and breakers connecting to the same train DC bus directly and bypassing the associated de-energized DC bus. A one time allowable outage time up to 112 hours is granted for each DC bus, one at a time, to allow for replacement of these breakers. Footnote \* shall not be applied to any of the busses during the 112 hour period.

ELECTRICAL POWER SYSTEMS

3/4.8.3 ONSITE POWER DISTRIBUTION (CONTINUED)

OPERATING

SURVEILLANCE REQUIREMENTS

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4.8.3.1 The specified A.C. busses and inverters shall be determined energized in the required manner at least once per 7 days by verifying correct breaker alignment and indicated voltage on the busses.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 155 TO FACILITY OPERATING LICENSE NPF-9

AND AMENDMENT NO. 137 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 February 23, 1995, as supplemented by letter dated March 21, 1995, Duke Power Company (the licensee) submitted a request for changes to the McGuire Nuclear Station, Units 1 and 2, Technical Specifications (TS). The requested changes would revise TS 3.8.2.1 and 3.8.3.1 to allow installation of replacement equipment in response to an Electrical Distribution Systems Functional Inspection, conducted by the NRC in July 1991. The existing breaker arrangement could result in a trip of both the battery and main breakers if a fault occurs on one of the 125-V dc panelboards. You committed to have these breakers replaced in 1995 with a better coordinated design to eliminate the concern. The March 21, 1995, letter provided clarifying information that did not change the scope of the February 23, 1995, application and initial proposed no significant hazards consideration determination.

2.0 BACKGROUND

The 125-V dc vital instrumentation and control power system supplies power to nuclear safety-related instrumentation and control loads requiring an uninterrupted power source to maintain safe reactor status during normal plant operation, a loss of offsite power (LOOP), a loss-of-coolant accident (LOCA), and a LOOP concurrent with a LOCA. It is a four-channel system shared between Units 1 and 2 with a spare charger that can be connected to these four channels, one or two at a time. This system is required to supply sufficient power to safety-related systems and components needed to mitigate the consequences of design-basis events. Should a loss of a battery charger or an ac power source occur, a single battery is capable of supplying two channels for 1 hour while maintaining sufficient terminal voltage. The 1-hour period is based on a conservative estimate of the time required to restore power to the battery chargers. The 125-V dc bus voltage indication, alarms (dc bus undervoltage, dc bus positive/negative ground, dc channel trouble), and computer points for each channel are provided in the control room. The dc channel trouble alarms include inputs from positions of the charger's input and output breakers, battery output breaker, distribution center's main incoming breaker and tie breaker, as well as undervoltage relays for the dc and ac panelboards.

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In July 1991, the staff completed an electrical distribution system functional inspection (EDSFI) at the McGuire Nuclear Station. In a letter to Duke Power Company (the licensee) dated July 31, 1991 (McGuire EDSFI Reports 50-369/91-09 and 50-370/91-09), the staff stated that the 125-V dc circuit breakers were miscoordinated so that a fault of more than 4500 A on a single branch circuit breaker would result in the opening of the main 600 A feeder breakers separating the battery and charger from the 125-V dc distribution center. This would result in a loss of one channel (approximately one-half of one train) for both Units 1 and 2 simultaneously. Both units would trip because of the loss of power to the main steam isolation valve solenoids. This miscoordination would have a more severe result if the distribution centers were cross connected with tie breakers, for example, during charger maintenance. In this case, both units would again trip; however, two trains of 125-V dc vital instrumentation and control (I&C) power could be lost.

In a letter to the staff dated September 27, 1991, the licensee stated that the most feasible solution was to replace the charger breaker, battery breaker, main breaker, and cross-tie breaker with nonfusible and fusible switches. The licensee also stated that it would determine the feasibility of providing full coordination in dc panelboards for branch circuit protection after considering concerns such as space limitation and plant operation during modifications.

In another letter to the staff dated December 12, 1991, the licensee stated that it would not be necessary to replace the charger breaker because the battery charger is provided with an internal current limiting feature. The licensee also stated that providing full coordination in dc panelboards was not feasible. In an additional letter to the staff dated August 26, 1994, the licensee stated that the main bus, battery, and cross-tie breakers would be replaced by December 31, 1995.

By letter dated February 23, 1995, the licensee submitted a technical specification change request for McGuire Nuclear Station, Units 1 and 2. These proposed changes are necessary to allow the installation of modifications to replace the battery, main, and tie circuit breakers in response to the EDSFI miscoordination concern.

#### Technical Specification Change Request

The licensee proposes to delete existing footnote # and add a new footnote in Technical Specification (TS) 3.8.2.1. It also proposes to delete the existing # sign in Items a through j in TS 3.8.3.1, add a # sign at the end of Items g through j, and add a new footnote in TS 3.8.3.1. Both the current and revised TSs are given below.

Current Footnote # in TS 3.8.2.1

#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.

Revised Footnote # in TS 3.8.2.1

#During periods of station modification associated with battery, main and tie breaker replacement only, the loads of a DC bus may be energized from a same train DC bus via temporary cables and breakers connecting to the same train DC bus directly and bypassing the de-energized DC bus. A one time allowable outage time up to 112 hours is granted for each DC bus, one at a time, to allow for replacement of these breakers. Footnote \* shall not be applied to any of the busses during the 112 hour period.

Current TS 3.8.3.1, Items a through j

- a. 4160-Volt Emergency Bus # ETA,
- b. 4160-Volt Emergency Bus # ETB,
- c. 600-Volt Emergency Bus # ELXA,
- d. 600-Volt Emergency Bus # ELXB,
- e. 600-Volt Emergency Bus # ELXC,
- f. 600-Volt Emergency Bus # ELXD,
- g. 120-Volt A.C. Vital Bus # EKVA energized from Inverter # EVIA connected to D.C. Channel 1, \*
- h. 120-Volt A.C. Vital Bus # EKVB energized from Inverter # EVIB connected to D.C. Channel 2, \*
- i. 120-Volt A.C. Vital Bus # EKVC energized from Inverter # EVIC connected to D.C. Channel 3, \* and
- j. 120-Volt A.C. Vital Bus # EKVD energized from Inverter # EVID connected to D.C. Channel 4, \*

Revised TS 3.8.3.1, Items a through j

- a. 4160-Volt Emergency Bus ETA,
- b. 4160-Volt Emergency Bus ETB,
- c. 600-Volt Emergency Bus ELXA,
- d. 600-Volt Emergency Bus ELXB,
- e. 600-Volt Emergency Bus ELXC,
- f. 600-Volt Emergency Bus ELXD,
- g. 120-Volt A.C. Vital Bus EKVA energized from Inverter EVIA connected to D.C. Channel 1, \* #
- h. 120-Volt A.C. Vital Bus EKVB energized from Inverter EVIB connected to D.C. Channel 2, \* #
- i. 120-Volt A.C. Vital Bus EKVC energized from Inverter EVIC connected to D.C. Channel 3, \* # and
- j. 120-Volt A.C. Vital Bus EKVD energized from Inverter EVID connected to D.C. Channel 4, \* #

Proposed Additional Footnote # in TS 3.8.3.1

#During periods of station modification associated with battery, main and tie breaker replacement only, two channel related inverter may be energized from a same train DC bus via temporary cables and breakers connecting to the same train DC bus directly and bypassing the associated de-energized DC bus. A one time allowable outage time up to 112 hours is granted for each DC bus, one at a time, to allow for replacement of these breakers. Footnote \* shall not be applied to any of the busses during the 112 hour period.

3.0 DISCUSSION AND EVALUATION

The licensee plans to replace the 600 A battery circuit breaker, 600 A distribution center main incoming circuit breaker, and 400 A tie circuit breaker for each of the four channels of the 125-V dc vital I&C power system. The battery circuit breaker will be replaced with a 600 A nonfusible switch, and the distribution center main incoming circuit breaker will be replaced with a 600 A fusible switch. The tie circuit breaker will be replaced with either the battery or main incoming breaker previously removed (these breakers are capable of being set at a higher instantaneous overcurrent setting than the existing 400 A tie circuit breaker). For the new arrangement a fusible switch will be used that has a greater time delay than the present main incoming breaker, thereby allowing enough time for the individual breakers to trip on a fault condition so that the entire distribution center (EVDA, EVDB, EVDC, or EVDD) will not be lost as a result of a fault on a panelboard.

The proposed TS changes allow the use of temporary cables and breakers to connect the loads of one vital dc bus (EVDA, EVDB, EVDC or EVDD) to another energized vital dc bus while that vital dc bus is deenergized for replacement of the battery, main, and tie circuit breakers. The proposed TS changes also allow a one-time outage time of up to 112 hours for each vital dc bus to complete all tasks associated with the replacement of these breakers. The licensee proposes 112 hours instead of the 72 hours currently allowed by TS 3.8.2.1, Action b.2, for two dc buses to be cross-tied together. With regard to the proposed 112 hours, the licensee stated that the expected time for implementation was 88 hours and the additional 24 hours was for contingencies that might arise during installation. To minimize the use of the 88 hours, the licensee will take the following steps:

1. As much work as possible will be performed prior to entering TS time.
2. Work will be in progress 24 hours a day with various parts of the implementation proceeding simultaneously.
3. DC panelboard circuit breakers for temporary alignment have been previously installed by minor modifications.
4. Spare circuit breakers and switches will be available.

5. Possibility of unacceptable battery degradation will be eliminated by monitoring battery voltage periodically throughout installation and having a spare charger available.

During installation of the modifications, all inputs to the dc channel trouble alarm, except those from the dc and ac panelboard undervoltage relays, will be isolated so that an undervoltage condition in a panelboard can be immediately detected. The temporary configuration, as described above, is technically compatible with the cross-tie configuration allowed by TS 3.8.2.1, Action b.2.

The use of temporary cables and breakers to facilitate the deenergization of a vital bus and connection of its loads to its same-train vital bus for breaker replacement does not technically violate the applicable TSs, since the intent of these TSs is to have uninterrupted power to the loads normally connected to this deenergized bus. The proposed TS changes do not involve significant relaxation in limiting conditions for operation. Even though the proposed changes involve a relaxation in outage time (112 hours rather than 72 hours), they are accompanied by compensatory conditions: (1) no equalizing charge on any of the three operable battery banks is allowed during this time, (2) all inputs to the dc channel trouble alarm except those from the associated dc and ac panelboard undervoltage relays will be blocked during this time so that an undervoltage condition on any of the dc and ac panelboards during this period will be detected, (3) a temporary portable charger will be available for charging the inoperable battery during this period if needed, (4) work done on the opposite train will be minimized during this period, and (5) installation of the modification will be carried out in accordance with implementation procedures. Thus, a commensurate level of safety will be maintained.

At no point during this modification will power be lost to the dc and ac panelboards. A normal plant procedure will be used to transfer power for the ac panelboards back and forth between their inverter and their alternate regulated ac power supplies. Instrumentation will remain valid to detect an undervoltage condition in the vital dc and ac panelboards being temporarily connected to their same-train power source. Temporary cables and breakers will meet all applicable safety Class 1E and seismic requirements. Temporary cabling will satisfy cable separation criteria. No degradation of distribution centers and panelboards will occur as a result of the installation of temporary breakers.

The proposed deletion of existing footnote # in TS 3.8.2.1 is an administrative change to remove this note because the battery replacement modifications are complete. The existing # sign in TS 3.8.3.1, Items a to j, previously meant the bus number and the proposed deletion of the existing # sign in TS 3.8.3.1, Items a through j, is an administrative change to avoid confusion with proposed footnote # in TS 3.8.2.1 and TS 3.8.3.1.

The proposed circuit breaker modifications will eliminate the EDSFI concern regarding 125-V dc breaker miscoordination involving a single fault of more than 4500 A on a 50 A single branch circuit that could trip both the battery and main incoming breaker. For the new arrangement a fusible switch will be used that has a greater time delay than the present main incoming breaker. If a single fault of more than 4500 A occurs on the branch circuit, the branch

circuit breaker and panelboard circuit breaker will open and clear the fault so that the entire distribution center (EVDA, EVDB, EVDC, or EVDD) will not be lost as a result of a single fault on a branch circuit.

However, the staff had concerns regarding the proposed circuit breaker modifications. The first concern was the following: when the 600 A battery circuit breaker is replaced by a 600 A nonfusible switch, the battery may not be protected if the fault is between the distribution center fusible switch and the battery nonfusible switch. In addition, although these switches are located in the same distribution center, the positive and negative bus could be inadvertently shorted by personnel working in the distribution center. The second concern was that given the fact that the present 600 A distribution center main incoming circuit breaker and the battery circuit breaker may trip if a fault occurs on one of the 125-V dc panelboards, the same breaker (600 A) when being replaced with the current 400 A tie circuit breaker may still not fully coordinate with the 125-V dc panelboard circuit breakers when these buses are cross tied, for example, during battery maintenance. The magnetic (instantaneous) trip characteristic can cause the 600 A tie circuit breaker to unlatch before the panelboard circuit breaker can clear a fault if the fault magnitude is greater than 5400 A.

During review activities, the staff had various technical discussions with the licensee. During these discussions, the staff expressed its concerns and requested additional information regarding the options the licensee considered before choosing the proposed breaker replacement. The licensee stated and subsequently documented in letter dated March 21, 1995, that the proposed breaker replacement modification would revise the electrical design to eliminate the EDSFI breaker miscoordination concern taking into consideration hardware limitations. Regarding the staff's first concern addressed above, the licensee stated that although all switches are located in the same distribution center, the conductors between the main and the battery switches are contained in this distribution center and are less than four feet in length. This distribution center also contains conductors connecting the charger circuit breaker and the battery switch. In both cases these conductors are insulated with silicone rubber rated for 600 V and 200°C. The node where the switches interconnect is insulated cable not bus bar; therefore, the positive and negative buses cannot be inadvertently shorted by personnel working in the distribution center. In addition, the licensee gave the reason why a fusible switch was not a feasible option as explained in Item e. below. On the basis of this information, the staff concludes that the response to the first concern is satisfactory.

Regarding the staff's second concern, the licensee stated that the proposed 600 A tie breaker, when compared to the existing 400 A tie breaker, will coordinate somewhat better with the 125-V dc panelboard breakers. The coordination when in the cross-tie configuration will be between the proposed main bus fusible switch and the panelboard breakers, instead of between the tie breakers and the panelboard breakers. In addition, the tie circuit breakers are only used to connect two channels under a limiting condition for operation (LCO) (TS 3.8.2.1, Action b). If a fault occurred on the panelboard of the channel without a battery during a LCO, that channel's tie circuit breaker would trip. This would isolate only the channel with the fault.

If the fault occurred on the panelboard of the channel with the battery, the associated panelboard feeder breaker would trip before the main bus fusible switch would trip. This action would isolate only the panelboard with the fault. During normal operation, the tie circuit breakers are not used to cross-tie channels. They are used to connect two channels during the battery service test every 18 months, battery performance discharge test every 60 months, and battery equalize charge. The battery equalize charge is performed on an as-needed basis when required by the quarterly pilot cell parameter test. However, an equalize charge has not been required in the past 3 years. On the basis of the above discussion, the staff finds the responses to the second concern satisfactory.

The options that the licensee considered before choosing the proposed breaker replacement and the reasons why those options were not considered feasible are as follows:

a. Replace Panelboards With Fuse PanelBoards:

This option was not explored in extensive detail simply because of the vast amount of installation, design and operating concerns that arise.

b. Replace Panelboard Feeder Molded Case Circuit Breakers (MCCBs) With Fuse Or Larger Circuit Breaker:

This option was considered and a suitable fuse could not be found which would ensure the upstream MCCBs would not unlatch. Increasing the size of the circuit breakers would require more space in the distribution center and larger compartments are not available. Increasing the panelboard feeder to the maximum which will fit in the compartment will not cause enough improvement to justify the cost of the changes (such as cable replacement).

c. Install Larger Circuit Breakers, Allowing Coordination:

After consulting several suppliers, no circuit breaker was found which could provide this function. This option would also require more space than is available in the distribution center. Cable termination would also need to be addressed.

d. Install a Fuse/MCCB Combination:

This design is used in reactor building penetration circuits. Available space and coordination with upstream devices prevent this from being a feasible option.

e. Install Battery Fused Switch Or Non-Fused Switch:

To delay isolation of the battery until the main fuse can operate, the battery fuse must have a higher long-time rating than the main fuse (above 600 A). Increasing the long-time rating of the fuse would remove any overload protection and require a larger switch

assembly. The larger assembly could not be accommodated in the existing enclosure. If the battery fuse were to operate prior to the main fuse, the charger would remain connected to the system because of its current limit feature. Since adding a fuse to the battery switch would not significantly improve the system and there are physical restrictions, a non-fusible switch was selected.

On the basis of the review of the information in the licensee submittal and supplemental information submitted by the licensee, the staff concludes that the proposed TS changes are necessary to allow the installation of modifications to replace the battery, main, and tie circuit breaker in response to the EDSFI miscoordination concern. In addition, the proposed changes do not affect any accident previously analyzed or create any possible new accidents and do not compromise the safety of the public. Thus, the proposed TS amendment is acceptable.

#### 4.0 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.

#### 5.0 ENVIRONMENTAL CONSIDERATION

The amendments change requirements with respect to installation or use 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 effluent 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 12791 dated March 8, 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.

#### 6.0 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: D. Nguyen

Date: April 14, 1995