ATTACHMENT 1

MARKED UP BASES & TECH SPEC PAGES

AND

REVISED TECH SPEC PAGES

INFORMATION ONLY

BASES

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

The Surveillance Requirements for demonstrating the OPERABILITY of the diesel generators are in accordance with the recommendations of Regulatory Guides 1.9, "Selection of Diesel Generator Set Capacity for Standby Power Supplies," March 10, 1971, 1.108, "Periodic Testing of Diesel Generator Units Used as Onsite Electric Power Systems at Nuclear Power Plants," Revision 1, August 1977, and 1.137, "Fuel-Oil Systems for Standby Diesel Generators," Revision 1, October 1979; also, Generic Letter 84-15, which modified the testing frequencies specified in Regulatory Guide 1.108.

Some of the Surveillance Requirements for demonstrating the operability of the diesel generators are modified by a footnote. The Specifications state the Surveillance Requirements are to be performed during shutdown, with the unit in mode 3 or higher. The footnote allows the particular surveillance to be performed during preplanned Preventative Maintenance (PM) activities that would result in the diesel generator being inoperable. The surveillance can be performed at that time as long as it does not increase the time the diesel generator is inoperable for the PM activity that is being performed. The footnote is only applicable at that time. The provision of the footnote shall not be utilized for operational convenience.

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 high specific gravity battery is returned to service (reconnected 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 or until replacement of these batteries with low specific gravity batteries. Low specific gravity batteries are not subjected to the 10 day restriction.

add Paragraph - see next page

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

INFORMATION ONLY

Paragraph for Insert into Bases page B 3/4 8-2:

In SURVEILLANCE 4.8.2.1.2.e, a modified performance discharge test may be performed in lieu of the performance discharge test. The modified performance discharge test is a combination of the performance discharge test and the service test resulting in a more conservative surveillance test.

INFORMATION ONLY

BASES

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

The Surveillance Requirements for demonstrating the OPERABILITY of the diesel generators are in accordance with the recommendations of Regulatory Guides 1.9, "Selection of Diesel Generator Set Capacity for Standby Power Supplies," March 10, 1971, 1.108, "Periodic Testing of Diesel Generator Units Used as Onsite Electric Power Systems at Nuclear Power Plants," Revision 1, August 1977, and 1.137, "Fuel-Oil Systems for Standby Diesel Generators," Revision 1, October 1979; also, Generic Letter 84-15, which modified the testing frequencies specified in Regulatory Guide 1.108.

Some of the Surveillance Requirements for demonstrating the operability of the diesel generators are modified by a footnote. The Specifications state the Surveillance Requirements are to be performed during shutdown, with the unit in mode 3 or higher. The footnote allows the particular surveillance to be performed during preplanned Preventative Maintenance (PM) activities that would result in the diesel generator being inoperable. The surveillance can be performed at that time as long as it does not increase the time the diesel generator is inoperable for the PM activity that is being performed. The footnote is only applicable at that time. The provision of the footnote shall not be utilized for operational convenience.

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."

high specific gravity

In SURVEILLANCE 4.8.2.1.2.e, after the battery is returned to service (reconnected 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 or until replacement of these batteries with low specific gravity batteries. Low specific gravity batteries are not subjected to the 10day restriction. 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.

high specific gravity

add Paragraph - see next page

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

INFORMATION ONLY

Paragraph for Insert into Bases page B 3/4 8-2:

In SURVEILLANCE 4.8.2.1.2.e, a modified performance discharge test may be performed in lieu of the performance discharge test. The modified performance discharge test is a combination of the performance discharge test and the service test resulting in a more conservative surveillance test.

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.

Insert See next page →

Delete →

#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.

INSERT for page 3/4 8-12

During periods of battery bank replacement only, the affected channel may be considered OPERABLE for up to 30 days provided a full capacity 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. This battery replacement option is only applicable once per battery bank.

Low Specific Gravity

TABLE 4.8-3

BATTERY SURVEILLANCE REQUIREMENTS (~~Gould~~ Cells)

	Category A (1)	Category B (2)	
PARAMETER	LIMITS FOR EACH DESIGNATED PILOT CELL	LIMITS FOR EACH CONNECTED CELL	ALLOWABLE (3) VALUE FOR EACH CONNECTED CELL
Electrolyte Level	> Minimum level indication mark, and ≤ ¼" above maximum level indication mark	> Minimum level indication mark, and ≤ ¼" above maximum level indication mark	Above top of plates, and not overflowing
Float Voltage	≥ 2.13 volts	≥ 2.13 volts (c)	> 2.07 volts
Specific Gravity (a)	≥ 1.200 (b)	≥ 1.195 Average of all connected cells > 1.205	Not more than .020 below the average of all connected cells or ≥ 1.195 Average of all connected cells ≥ 1.195(b)

(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) High Specific Gravity

BATTERY SURVEILLANCE REQUIREMENTS (~~AT&T~~ Cells)

	Category A (1)		Category B(2)	Category C(3)
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 ≤ 1/4" above maximum level indication mark		≥ Minimum level indication mark, and ≤ 1/4" above maximum level indication mark	Above top of plates, and not overflowing
Float Voltage	≥ 2.20 Volts		≥ 2.17 Volts (4)	> 2.14 Volts
Specific (5) Gravity	≥ 1.285 (6)	CELL	≥ 1.280	Not more than 0.020 below the average of all connected cells or ≥ 1.280
		BATTERY	Average of all connected cells > 1.285 (7)	Average of all connected cells ≥ 1.280 (6)(7)

(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 limits.

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.

Insert See next page →

#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.

Delete →

INSERT for page 3/4 8-12

During periods of battery bank replacement only, the affected channel may be considered OPERABLE for up to 30 days provided a full capacity 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. This battery replacement option is only applicable once per battery bank.

Low Specific Gravity

TABLE 4.8-3

BATTERY SURVEILLANCE REQUIREMENTS (~~Gould~~ Cells)

	Category A (1)	Category B (2)	
PARAMETER	LIMITS FOR EACH DESIGNATED PILOT CELL	LIMITS FOR EACH CONNECTED CELL	ALLOWABLE (3) VALUE FOR EACH CONNECTED CELL
Electrolyte Level	> Minimum level indication mark, and ≤ ¼" above maximum level indication mark	> Minimum level indication mark, and ≤ ¼" above maximum level indication mark	Above top of plates, and not overflowing
Float Voltage	≥ 2.13 volts	≥ 2.13 volts (c)	> 2.07 volts
Specific Gravity (a)	≥ 1.200 (b)	≥ 1.195 Average of all connected cells > 1.205	Not more than .020 below the average of all connected cells or ≥ 1.195 Average of all connected cells ≥ 1.195(b)

(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) High Specific Gravity

BATTERY SURVEILLANCE REQUIREMENTS (~~AT&T~~ Cells)

	Category A (1)		Category B(2)	Category C(3)
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 ≤ 1/4" above maximum level indication mark		≥ Minimum level indication mark, and ≤ 1/4" above maximum level indication mark	Above top of plates, and not overflowing
Float Voltage	≥ 2.20 Volts		≥ 2.17 Volts (4)	> 2.14 Volts
Specific (5) Gravity	≥ 1.285 (6)	CELL	≥ 1.280	Not more than 0.020 below the average of all connected cells or ≥ 1.280
		BATTERY	Average of all connected cells > 1.285 (7)	Average of all connected cells ≥ 1.280 (6)(7)

(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 limits.

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 battery bank replacement only, the affected channel may be considered OPERABLE for up to 30 days provided a full capacity 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. This battery replacement option is only applicable once per battery bank.

TABLE 4.8-3

BATTERY SURVEILLANCE REQUIREMENTS (Low Specific Gravity Cells)

	Category A (1)	Category B (2)	
PARAMETER	LIMITS FOR EACH DESIGNATED PILOT CELL	LIMITS FOR EACH CONNECTED CELL	ALLOWABLE (3) VALUE FOR EACH CONNECTED CELL
Electrolyte Level	> Minimum level indication mark, and ≤ ¼" above maximum level indication mark	> Minimum level indication mark, and ≤ ¼" above maximum level indication mark	Above top of plates, and not overflowing
Float Voltage	≥ 2.13 volts	≥ 2.13 volts (c)	> 2.07 volts
Specific Gravity (a)	≥ 1.200 (b)	≥ 1.195 Average of all connected cells > 1.205	Not more than .020 below the average of all connected cells or ≥ 1.195 Average of all connected cells ≥ 1.195(b)

(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 (High Specific Gravity Cells)

	Category A (1)		Category B(2)	Category C(3)
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 ≤ 1/4" above maximum level indication mark		≥ Minimum level indication mark, and ≤ 1/4" above maximum level indication mark	Above top of plates, and not overflowing
Float Voltage	≥ 2.20 Volts		≥ 2.17 Volts (4)	> 2.14 Volts
Specific (5) Gravity	≥ 1.285 (6)	CELL	≥ 1.280	Not more than 0.020 below the average of all connected cells or ≥ 1.280
		BATTERY	Average of all connected cells > 1.285 (7)	Average of all connected cells ≥ 1.280 (6)(7)

(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 limits.

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 battery bank replacement only, the affected channel may be considered OPERABLE for up to 30 days provided a full capacity 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. This battery replacement option is only applicable once per battery bank.

TABLE 4.8-3

BATTERY SURVEILLANCE REQUIREMENTS (Low Specific Gravity Cells)

	Category A (1)	Category B (2)	
PARAMETER	LIMITS FOR EACH DESIGNATED PILOT CELL	LIMITS FOR EACH CONNECTED CELL	ALLOWABLE (3) VALUE FOR EACH CONNECTED CELL
Electrolyte Level	> Minimum level indication mark, and ≤ ¼" above maximum level indication mark	> Minimum level indication mark, and ≤ ¼" above maximum level indication mark	Above top of plates, and not overflowing
Float Voltage	≥ 2.13 volts	≥ 2.13 volts (c)	> 2.07 volts
Specific Gravity (a)	≥ 1.200 (b)	≥ 1.195 Average of all connected cells > 1.205	Not more than .020 below the average of all connected cells or ≥ 1.195 Average of all connected cells ≥ 1.195(b)

(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 (High Specific Gravity Cells)

	Category A (1)		Category B(2)	Category C(3)
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 ≤ 1/4" above maximum level indication mark		≥ Minimum level indication mark, and ≤ 1/4" above maximum level indication mark	Above top of plates, and not overflowing
Float Voltage	≥ 2.20 Volts		≥ 2.17 Volts (4)	> 2.14 Volts
Specific (5) Gravity	≥ 1.285 (6)	CELL	≥ 1.280	Not more than 0.020 below the average of all connected cells or ≥ 1.280
		BATTERY	Average of all connected cells > 1.285 (7)	Average of all connected cells ≥ 1.280 (6)(7)

(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 limits.

ATTACHMENT 2

TECHNICAL JUSTIFICATION

Technical Discussion of System Design

The 125 VDC Vital Instrumentation and Control Power System is provided to supply power to nuclear safety related instrumentation and control loads requiring an uninterrupted power source to maintain safe reactor status during the following plant conditions:

1. Normal Plant Operation (including startup and shutdown)

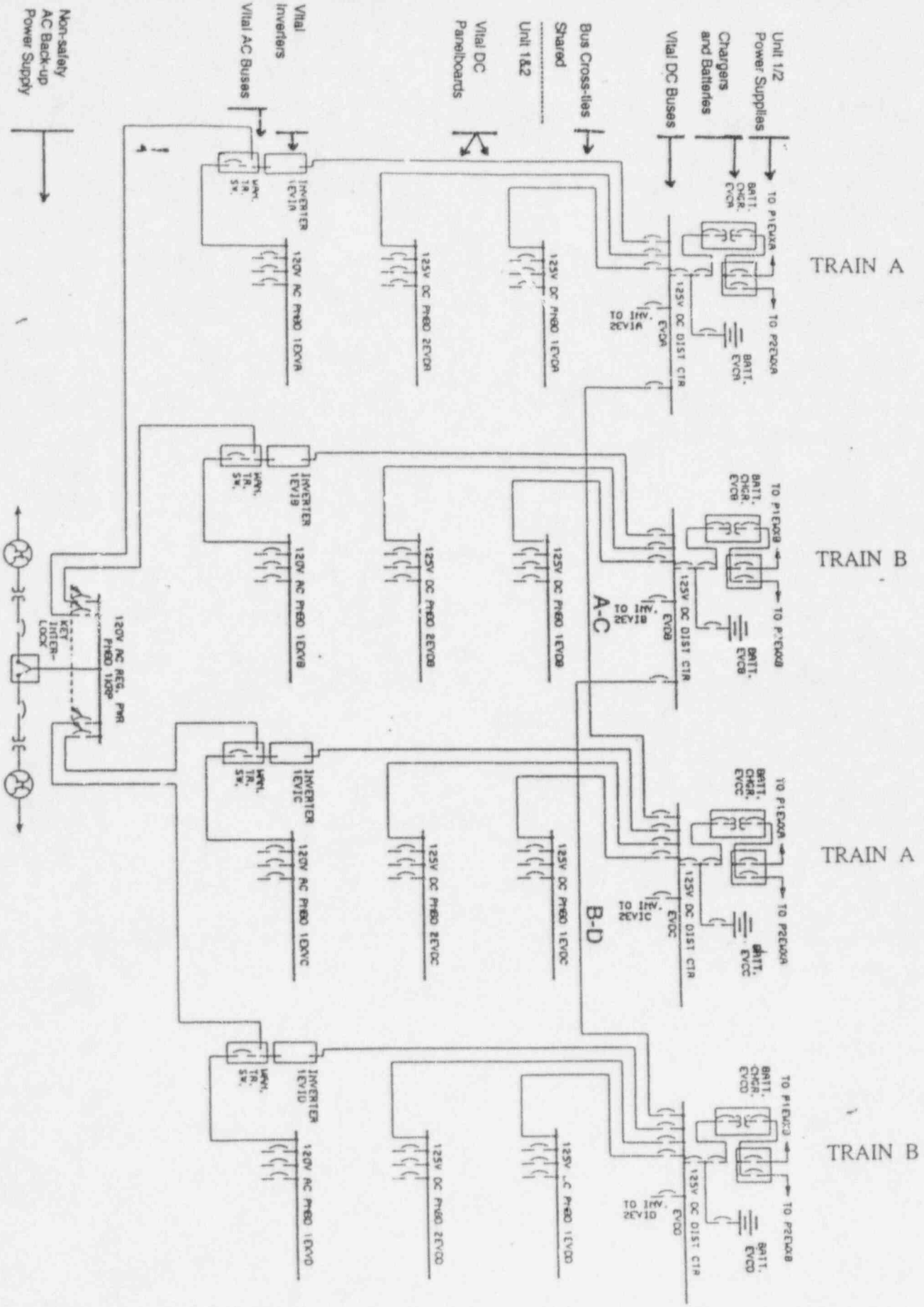
2. Station Blackout or Loss of Offsite Power (LOOP)

3. Design Basis Events (DBE) including but not limited to Main Steam Line Breaks (MSLB), Steam Generator Tube Rupture accidents, and Loss of Coolant Accidents (LOCA)

4. Station Blackout or LOOP concurrent with the DBE listed in (3) above.

The design of the 125 VDC I & C power system (see Figure 1) is such that four batteries, chargers and distribution centers serve both units. Each of the four batteries and chargers are connected through their own respective distribution center which is shared by both Units 1 and 2. The loads served from these distribution centers are unitized, providing a 125 VDC power panelboard and inverter for each unit. The distribution centers are designed to provide cross-tie capability with its "associated" distribution center of the same train (load group).

During normal operation, the independent and physically separated batteries are floated on the buses and assume load without interruption upon loss of a battery charger or AC power source. Battery chargers EVCA, EVCB, EVCC, and EVCD provide DC power to their respective distribution centers and maintain their respective batteries at float conditions. The 125 VDC distribution centers supply power to their respective 125 VDC power panelboards and the 120 VAC vital power inverters. All distribution center and power panelboard circuit breakers are closed except for the bus tie breakers and the spare battery charger distribution center breakers in EVDS. Battery bus voltage is indicated by voltmeters located on the 125 Volt DC vital control distribution centers. The battery bus voltage is also monitored by under-voltage relays which alarm when the voltage reaches a predetermined point. Adequate capacity to perform its intended safety function is still available at this setpoint.



Vital Instrumentation and Control Power System

FIGURE 1

When the ACTION statement of Technical Specification 3.8.2.1.b.2 is invoked via OPERABLE tie breakers, and one battery and charger is removed from its bus, the distribution center (of the removed battery) and its normal loads are still energized by a full capacity charger and battery of the same affected train. For this alignment, one battery is serving two buses on one train. On the other train, two batteries are serving two buses, while assuring train redundancy at all times. All four batteries, including the one serving two buses during the Allowable Outage Time (AOT), are sized to serve normal and emergency loads of both buses. They independently have the capacity to automatically supply minimum engineered safety feature DC loads for accident conditions in one unit and safely shut down the other unit assuming both a loss of offsite power and a single failure in the 125 VDC system.

During a blackout or LOOP on one or both trains, the essential motor control centers feeding the Vital Instrumentation and Control Battery Chargers associated with the affected train will be load shed by the Emergency Diesel Generator (EDG) load sequencer. No more than eleven seconds after the diesel generator start signal, the affected essential motor control centers and battery chargers will be reloaded onto the essential bus by the diesel load sequencer. During the time period that the battery chargers are deenergized, the batteries, alone, feed the vital instrumentation and control loads.

The McGuire shared DC system design is not vulnerable to a single failure (Reg Guide 1.6) because of the additional capacity and redundancy explained above. For all design basis events, any single battery by itself can supply an entire train of DC loads. The interaction between each unit's 125 VDC system is limited such that allowable combinations of maintenance and test operations as governed by the plant Technical Specifications will not preclude the system's capability to automatically supply power to minimum ESF DC loads in either unit, assuming a loss of offsite power.

Temporary Battery Description

The Vital Batteries could be replaced one at a time by cross-tying Vital Buses of the same train with an extension of the 72 hour LCO. However, the use of a temporary battery bank, sized in accordance with IEEE Std. 485-1983, to serve the affected bus while the normal Vital Battery for that bus is replaced will prevent the extension of the 72-hour LCO. Therefore, during the time period that each battery bank is being replaced, a temporary battery bank composed of new low specific gravity cells will be installed and connected to the affected 125 VDC bus using a temporary operating procedure developed and approved for this purpose.

All necessary training related to the procedure will be performed prior to replacement of the first battery bank.

The temporary battery bank will be located in Room 700 of the McGuire Service Building (Shared Load Center Room) and will be tied to the DC side of the standby battery charger (EVCS) via safety related EVDS Distribution Center breaker 1B, using temporary non-safety cables. The standby charger and temporary battery combination will be connected to the affected 125 VDC bus before that channel's battery is disconnected, removed and replaced.

Before being connected to the Vital Bus, the temporary battery will receive a full compliment of surveillance measurements, including a Service Test. 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.

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.

The Service Building is not a Seismic Category 1 structure and the temporary battery will not be seismically mounted. In addition, the temporary battery will not be stored in an area protected from tornado or missiles,or where Equipment Qualification has been performed. All of these factors were reviewed and were found to be insignificant when calculating the actual risk associated with the short duration of the battery replacement.

If the temporary battery configuration should become degraded and incapable of fulfilling the required function while a battery bank is being replaced, then the affected 125 VDC 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.

Battery Replacement Discussion

The GNB Type NCN stationary battery (see Figure 2) has been chosen as the first option to replace the AT&T round cells. The GNB Type NCN battery is of a conventional rectangular

FIGURE 2

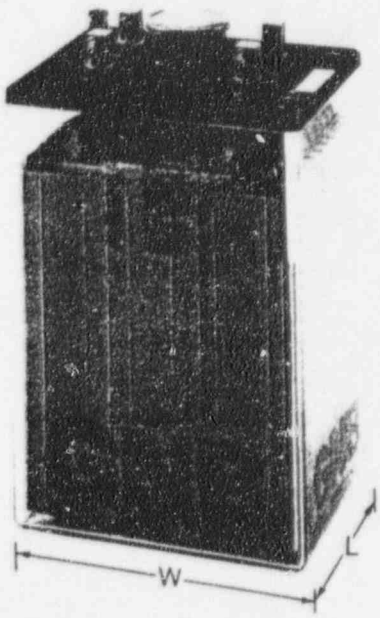
GNB

Section 2-20N
Nuclear Class 1E Stationary Batteries

†N*N are the nuclear variant of GNB's commercial N*X line.

TYPE NAN† - LEAD ANTIMONY
TYPE NCN† - LEAD CALCIUM
CAPACITIES-550 A.H. to 2550 A.H.
@ 8 HOUR RATE TO 1.75 V.P.C. AVERAGE

20 YEAR LIFE EXPECTANCY



SPECIFICATIONS

- **Jar** — Styrene-Acrylonitrile (SAN) Plastic
- **Cover** — Butadiene Styrene Rubber

Separators — Microporous Material

Retainers — Fiberglass Mats

Posts — NAN/NCN 7-17 two-1.5" (38.1 mm) square
NAN/NCN 19-27 four-1.0" (25.4 mm) square
NAN/NCN 29-35 four-1.5" (38.1 mm) square

Post Seals — Floating "O" Ring - Seal Nut

Vents — GNB "Pre-Vent" Flame Arrester

Level Lines — High and Low - All Jar Faces

Electrolyte — Height Above Plates - 2.75" (69.9 mm)

Electrolyte Withdrawal Tubes — 2 per cell

Sediment Space — 1.06" (26.9 mm)

Specific Gravity — 1.215 @ 77°F (25°C)

Inter-Cell Connectors — Lead Plated Copper

- **Optional** — Polycarbonate Jar and Cover
28% Limiting Oxygen Index (L.O.I.)
NAN/NCN 19 to 35 Types only

Qualified according to IEEE 535
Tested according to IEEE 450

Plate Dimensions	Height	Width	Thickness
Positive Plate	15.0 in 381.0 mm	12.5 in 317.5 mm	.320 in 8.13 mm
Negative Plate	15.0 in 381.0 mm	12.5 in 317.5 mm	.215 in 5.46 mm

Cell Type	NOM AH CAP	Amperes To 1.75 V.P.C. Average							Overall Dimensions (in/mm)			Approximate Weight (lbs/kg)		Electro-lyte Per Cell
		8 Hr.	5 Hr.	3 Hr.	1 Hr.	30 Min.	15 Min	1 Min.	Length	Width	Height	Net	Packed	(gal/liter)
NCN/NAN-7	550	69	96	134	245	300	340	436	7.38 in 187 mm	14.5 in 368 mm	22.13 in 562 mm	160 lbs 72 kg	168 lbs 76 kg	6.4 gal 24.2 liter
NCN/NAN-9	690	86	124	165	300	454	515	582	7.38 in 187 mm	14.5 in 368 mm	22.13 in 562 mm	177 lbs 80 kg	189 lbs 86 kg	6 gal 22.7 liter
NCN/NAN-11	825	103	149	200	375	561	686	727	7.38 in 187mm	14.5 in 368 mm	22.13 in 562 mm	195 lbs 89 kg	207 lbs 94 kg	5.5 gal 21.2 liter
NCN/NAN-13	950	119	171	238	450	666	814	873	7.38 in 187 mm	14.5 in 368 mm	22.13 in 562 mm	213 lbs 97 kg	225 lbs 102 kg	5.1 gal 19.3 liter
NCN/NAN-15	1070	134	194	277	525	768	939	1018	7.38 in 187 mm	14.5 in 368 mm	22.13 in 562 mm	231 lbs 105 kg	243 lbs 110 kg	5.0 gal 18.9 liter
NCN/NAN-17	1200	150	216	312	600	867	1060	1165	7.38 in 187 mm	14.5 in 368 mm	22.13 in 562 mm	269 lbs 112 kg	281 lbs 128 kg	4.9 gal 18.5 liter
NCN/NAN-19	1370	171	246	357	675	953	1165	1260	9.25 in 235 mm	14.5 in 368 mm	22.5 in 572 mm	282 lbs 128 kg	294 lbs 134 kg	6.3 gal 23.8 liter
NCN/NAN-21	1495	187	270	390	750	1033	1263	1400	9.25 in 235 mm	14.5 in 368 mm	22.5 in 572 mm	301 lbs 137 kg	313 lbs 142 kg	6.0 gal 22.7 liter
NCN/NAN-23	1670	209	301	436	825	1136	1389	1540	11.38 in 289 mm	14.5 in 368 mm	22.5 in 572 mm	348 lbs 158 kg	366 lbs 166 kg	8.0 gal 30.3 liter
NCN/NAN-25	1810	226	326	472	900	1232	1506	1680	11.38 in 289 mm	14.5 in 368 mm	22.5 in 572 mm	364 lbs 165 kg	382 lbs 174 kg	7.6 gal 28.2 liter
NCN/NAN-27	1945	243	351	507	975	1327	1622	1840	11.38 in 289 mm	14.5 in 368 mm	22.5 in 572 mm	380 lbs 173 kg	398 lbs 181 kg	7.3 gal 27.6 liter
NCN/NAN-29	2150	269	389	555	1050	1429	1747	1932	14.56 in 370 mm	14.5 in 368 mm	22.5 in 572 mm	446 lbs 203 kg	464 lbs 211 kg	11.5 gal 43.5 liter
NCN/NAN-31	2280	285	411	595	1125	1531	1872	2070	14.56 in 370 mm	14.5 in 368 mm	22.5 in 572 mm	462 lbs 210 kg	480 lbs 218 kg	10.9 gal 41.3 liter
NCN/NAN-33	2415	302	435	629	1200	1633	1966	2220	14.56 in 370 mm	14.5 in 368 mm	22.5 in 562 mm	479 lbs 218 kg	497 lbs 226 kg	10.3 gal 39.0 liter
NCN/NAN-35	2550	319	459	663	1275	1735	2121	2350	14.56 in 370 mm	14.5 in 368 mm	22.5 in 572 mm	496 lbs 225 kg	514 lbs 234 kg	9.7 gal 36.7 liter

cell design with a traditional vertical plate design. The second option is to use new low specific gravity round cells. Both options for battery replacement are sized in accordance with IEEE Std. 485-1983 and will meet the current licensing basis and will perform the same safety function as the existing vital battery.

Replacing the Vital Batteries will require the existing 59 AT&T Round Cells (per channel) to be disconnected and removed from their mounting rack one cell at a time. Each cell weighs approximately 350 pounds and must be mechanically lifted out of its individual rack, transversed to the adjacent isle, then lowered onto a cart for transportation out of the battery room. The replacement cells will be unpacked, transported to the 733 elevation battery room, and installed into a new rack one cell at a time. New intercell connectors and intertier jumpers/cables will be connected and tested for connection resistance using a digital low resistance ohmmeter (DLRO).

The new bank will then be charged and will receive a full compliment of surveillance measurements including a service test(TS 4.8.2.1.2d.1). The battery will be recharged after testing using existing station procedures and post-charge Tech Spec surveillance measurements taken to determine operability. Factory acceptance tests will be used to satisfy TS 4.8.2.1.2e rather than performing an onsite performance discharge test(TS 4.8.2.1.2e).

It has been determined that the replacement of each Vital Battery will take approximately 30 days. The first battery scheduled to be replaced is EVCA. The time that a battery bank is removed from service for replacement will be kept to an absolute minimum. Replacement activities are scheduled for 7-day, 24-hour work coverage. The replacement time line (per channel) is as follows:

ACTIVITY	TIME REQUIRED
1) Remove Old Battery (isolate power, disconnect cables, disconnect intercell connectors, remove cells, disassemble and remove rack)	96 hours
2) Remove old anchors and repair floor (includes 7 day cure time for concrete)	240 hours

3) Remove new cells from box and transport to Battery Room	24 hours
4) Install new battery (assemble new rack, install new cells, attach intercell connectors, intertier jumpers, and associated hardware)	160 hours
5) Connect power cables and check system for continuity and ground	48 hours
6) Battery Charged	24 hours
7) Allowance for Hydrogen Gas Decay Period	6 hours
8) Battery Service Test (includes set-up)	12 hours
9) Battery Charged	24 hours
10) Allowance for Hydrogen Gas Decay Period	6 hours
11) Post-Charge Tech Spec Surveillance Measurements/place vital battery back on vital bus	8 hours
12) Contingency allowance	72 hours
TOTAL	**720 hours (30 days)**

Description of Proposed TS Changes

The proposed amendment will provide the option of replacing the 125VDC vital battery banks on-line as was done in 1991-92. McGuire currently has AT&T high specific gravity round cell batteries installed in all four battery banks of the vital 125VDC system. These batteries were initially installed with both units at 100% power level in 1991-92. TS Amendment 121/103 (see Attachment 5) made provisions for the on-line replacement.

On October 28, 1996, vital battery bank EVCC failed to meet the TS required 80% capacity even though the service test had already demonstrated that the battery bank could meet

the design basis requirements of a 1 hour duty cycle. As a result, both McGuire units were shutdown to Mode 5 until the cells of battery EVCC were replaced with new high specific gravity cells.

This proposed amendment (see #Footnote in Attachment 1, TS pages 3/4 8-12 for Units 1 and 2) will provide the same once per bank option regarding battery replacement as the 1991-92 amendment. Technical Specification 3/4.8.2 (Limiting Conditions for Operation 3.8.2.1) is modified by replacing the existing #Footnote for items a through d. This new 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 described previously is connected to the respective bus. Although current plans are to utilize the standby battery charger EVCS in conjunction with the temporary battery, the footnote is phrased to only specify that a full capacity charger is required. In the unforeseen event that the standby charger becomes unavailable, this would allow the normal charger to be utilized. Plans to change out the current high specific gravity round cells to conventional low specific gravity cells are in progress. The initial changeout of battery bank EVCA is targeted for early February, 1997.

Additionally, the proposed amendment changes the title of TS Tables 4.8-3 (see Attachment 1, TS Pages 3/4 8-15 and 8-16 for both Units 1 and 2) to provide for the use of either low or high specific gravity batteries in the 125VDC vital battery application. During the battery replacement process (in which each individual vital battery bank is changed out separately), both low and high specific gravity cells will be in service until the battery replacement project on all four battery banks is completed in late 1997.

McGuire UFSAR was reviewed including Section 8.3 (Onsite Power Sources) and no changes are required to the UFSAR regarding this TS amendment.

Since the proposed Technical Specification changes are temporary changes which will expire when all four vital battery banks have been replaced with new cells, the Bases of the affected Technical Specifications are not being changed to reflect the temporary provisions. The bases for these temporary provisions will be documented via this submittal and the NRC Safety Evaluation Report approving these proposed amendments. A marked up copy of proposed changes to the Bases regarding the 10-day recharge limitation and battery testing is included in Attachment 1 for information only. These Bases changes will be finalized

via 10CFR50.59 analysis as part of the TS amendment implementation process.

Conclusions

Recent experience with high specific gravity round cells in the industry has revealed that these batteries are subject to accelerated battery degradation. Both inadvertent discharges and discharges associated with battery surveillance testing may potentially result in decreased battery capacity. The operating history at McGuire has not resulted in an appreciable number of inadvertent battery discharges thus the vulnerability to this discharge mode is low. Regarding discharges associated with battery surveillance testing, the proposed battery replacement schedule will result in installation of new low specific gravity cells by the end of 2EOC11.

During the time period of battery bank replacement, a full capacity temporary battery bank will be installed and connected to the 125 VDC bus so that the bus and all associated safety related equipment remain battery backed with a dedicated battery bank and charger at all times.

Based on the above Technical Justification, there is no significant decrease in margin of safety or increased risk of core damage associated with this amendment request.

ATTACHMENT 3

NO SIGNIFICANT HAZARDS CONSIDERATION EVALUATION

The following analysis is provided in accordance with the criteria of 10 CFR 50.92 to determine if the proposed change will involve a significant hazards consideration. This determination ensures that the operation of the facility in accordance with the proposed amendment would not:

(1) involve a significant increase in the probability or consequences of an accident previously evaluated; or

(2) create the possibility of a new or different kind of accident from any accident previously evaluated; or

(3) involve a significant reduction in a margin of safety.

The proposed amendment modifies the requirements of Technical Specification 3.8.2 to (1) provide for on-line replacement of the vital batteries at a frequency not to exceed once per bank and (2) to allow use of conventional low specific gravity cells to replace the 125VDC Battery Banks. The proposed amendment adds the required cell and bank parameters to be measured for the replacement battery to Table 4.8-3.

The following evaluation assesses aspects of this proposal against the Part 50.92(c) requirements to demonstrate that all three standards are satisfied.

First Standard

Operation of the facility in accordance with the proposed amendment will not involve a significant increase in the probability or consequences of an accident previously evaluated.

The 125 volt DC Vital Instrumentation and Control Power System is not an accident initiator. It serves as an accident mitigation system. The new battery will be seismically mounted. There is no change in cabling required for the new battery and no change in the physical and electrical separation provisions for the battery. The performance of plant safety functions will not be degraded by the new battery.

The replacement battery consists of conventional low specific gravity cells which will be purchased to meet the same plant requirements as the installed battery. The replacement batteries will be purchased from a 10CFR21 Supplier whose 10CFR50 Appendix B Program has been audited by Duke's Supplier Verification Group.

Implementation of each battery bank replacement will require approximately 30 days. During the replacement period, a temporary battery bank, procured through the Commercial Grade Program for 1E usage, will be connected in place. The temporary battery will be installed in the Service Building due to space limitations in the Battery Room in the Auxiliary Building. During each battery replacement period, the remaining three vital battery banks and their associated equipment will remain in their normal configuration and will not be reconfigured for preplanned activities or routine maintenance. The performance of their safety functions will not be degraded. The 125VDC Vital I&C Power System will be restored to the fully qualified configuration following each battery replacement period.

The ability to cross-tie the electrical buses for the batteries(as allowed by TS LCO Action Statements) by manual action per procedure remains available as a backup in the event that the temporary battery is rendered unavailable during the replacement period. Each vital battery is sized to carry the continuous emergency and anticipated momentary loads of the its own vital bus, and to also assume the loads of another vital bus (in a backup capacity), all for a one hour duty cycle.

The ambient temperature surrounding the temporary battery will be periodically monitored to ensure it remains with the battery specifications. Available ventilation in the temporary battery area is sufficient to prevent accumulation of excess hydrogen.

For the above reasons, it can be concluded that the proposed amendment will not involve a significant increase in the probability or consequences of an accident previously evaluated.

Second Standard

The amendment would not create the possibility of a new or different kind of accident from any kind of accident previously evaluated.

There are no new or common failure modes created by the use of low specific gravity cells. The low specific gravity battery has exhibited consistently high reliability and will perform the same function as the existing batteries.

The GNB Type NCN stationary battery (see Figure 3) has been chosen as the first option to replace the AT&T round cells. The GNB Type NCN battery is of a conventional rectangular cell design with a traditional vertical plate design. The second option is to use new low specific gravity round cells for replacement. Both options for battery replacement are sized in accordance with IEEE Std. 485-1983.

The temporary battery will be comprised of new low specific gravity cells. The temporary battery and its rack will be the same equipment that is normally used with the exclusion of the seismic bracing and mounting apparatus. With the temporary battery connected, there are no new failure modes for the distribution equipment associated with the battery being replaced.

The temporary battery installation creates a potentially new failure mode due to lack of seismic mounting and the location of the temporary batteries(outside of the Vital Area in a non-Seismic Category 1 structure). This new failure mode is considered insignificant due to the short duration for which the temporary configuration will be in place. Duke Power has analyzed the temporary battery configuration from a probabilistic risk assessment standpoint and has found the temporary battery has no significant impact on the CDF at McGuire.

For these reasons, the possibility of a new or different kind of accident from any kind of accident previously evaluated is not created.

Third Standard

The amendment would not involve a significant reduction in a margin of safety.

The vital batteries are required to power emergency and safe shutdown loads for safety related instrument and control equipment during certain accident conditions. Ultimately, safety related equipment required to maintain the integrity of fission product barriers depend upon proper performance of the new battery. The new low specific gravity battery will meet the current licensing basis and will perform the same safety function as the existing vital battery. As such, the replacement battery will not affect any fission product barriers. The temporary battery is also fully capable of performing the safety function of the system if required and, thus, will have no detrimental impact on any fission product barriers. All required procedures and training will be developed and implemented prior to battery replacement. During the periods of battery replacement, if the temporary battery should become unavailable, the affected 125VDC channel will be declared inoperable and the normal TS LCO will be applied.

Since the acceptance limits with respect to the required redundancy and functional capability of the battery system are not affected by this change, there is no reduction in the margin of safety.

Conclusion

Based on the above and the supporting technical justification, Duke Power Company has concluded that there is no significant hazard involved in this amendment request.

ATTACHMENT 4

ENVIRONMENTAL IMPACT EVALUATION

The proposed technical specification amendment has been reviewed against the criteria of 10CFR51.22 for environmental considerations. The proposed amendment does not involve a significant hazard, nor increase the types and amounts of effluents that may be released offsite, nor increase individual or cumulative occupational radiation exposures. Therefore, the proposed amendment meets the criteria given in 10CFR51.22(c)(9) for an Environmental Impact Statement.

ATTACHMENT 5

DUKE POWER TS SUBMITTAL APRIL 16,1991

AND

ONRR AMENDMENT APPROVAL JULY 1, 1991

ATTACHMENT 5

DUKE POWER TS SUBMITTAL APRIL 16,1991

AND

ONRR AMENDMENT APPROVAL JULY 1, 1991

Duke Power Company
Nuclear Production Dept
P.O. Box 1007
Charlotte, N.C. 28201-1007

M.S. Tuckman
Vice President
Nuclear Operations
(704) 373-3011

DUKE POWER

April 16, 1991

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

Subject: McGuire Nuclear Station
Docket Nos. 50-369 and 50-370
Proposed Technical Specifications Changes
Replacement of 125 Volt DC Vital Batteries
(T.S. 3/4.8.2 and Bases Section 3/4.8)

Gentlemen:

Pursuant to 10CFR 50.4 and 50.90, attached are proposed license amendments to Appendix A, Technical Specifications, of Facility Operating Licenses NPF-9 and NPF-17 for McGuire Nuclear Station Units 1 and 2, respectively. The proposed amendments are a one-time only change necessary to allow replacement of the existing 125 volt DC battery cells with new cells. This replacement will result in a net enhancement in safety at McGuire Nuclear Station due to increasing the reliability of the 125 Volt DC Vital Instrumentation and Control Power System.

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. We will ensure that all procedures and training required to safely conduct the battery replacement operation are developed and implemented.

Attachment 1 contains the proposed Technical Specifications changes. Attachment 2 contains the justification and safety analysis for the proposed changes. Pursuant to 10CFR 50.91, Attachment 3 provides the analysis performed in accordance with the standards contained in 10CFR 50.92 which concludes that the proposed amendments do not involve a Significant Hazards Consideration. Duke Power is forwarding a copy of this amendment request application and No Significant Hazards Consideration Analysis to the North Carolina Department of Human Resources. The proposed amendments have been reviewed and have been determined to have no adverse safety or environmental impact.

It is requested that review and approval of these proposed amendments be expedited to allow replacement of two of the 125 volt DC battery banks

prior to the next refueling outage, which is currently scheduled to begin on August 30, 1991. The first battery bank is currently scheduled to be replaced beginning on July 1, 1991.

Any changes required to the McGuire Final Safety Analysis Report as a result of the new batteries will be implemented after all four battery banks have been replaced. It is anticipated that the FSAR changes will be made in conjunction with the September 1993 update.

Should there be any questions concerning these proposed amendments or if additional information is required, please call L.J. Rudy at (704) 373-3413.

Very truly yours,

M.S. Tuckman

M.S. Tuckman

LJR003/ljr

Attachments

xc: (W/Attachments)
Mr. S.D. Ebneter
Regional Administrator
U.S. Nuclear Regulatory Commission
Region II
101 Marietta St., NW, Suite 2900
Atlanta, Georgia 30329

Mr. Dayne Brown, Chief
Radiation Protection Branch
Division of Facility Services
Department of Human Services
701 Barbour Drive
Raleigh, N.C. 27603-2008

Mr. T.A. Reed
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
One White Flint North, Mail Stop 9H3
Washington, D.C. 20555

Mr. P.K. VanDoorn
NRC Senior Resident Inspector
McGuire Nuclear Station

M.S. Tuckman, being duly sworn, states that he is Vice President of Duke Power Company; that he is authorized on the part of said Company to sign and file with the Nuclear Regulatory Commission this revision to the McGuire Nuclear Station License Nos. NPF-9 and NPF-17 and that all statements and matters set forth therein are true and correct to the best of his knowledge.

M.S. Tuckman

M.S. Tuckman, Vice President

Subscribed and sworn to before me this 16th day of April, 1991.

Linda Gail Smith

Notary Public

My Commission Expires:

May 16, 1995

bxc: (W/Attachments)
A.V. Carr
R.C. Futrell
R.L. Gill, Jr.
S.C. Benesole
P.F. Guill
R.G. Morgan
L.J. Rudy
S.A. Gewehr
D.V. Ethington
P.R. Herran
W.M. Sample
T.F. Wyke
D.W. Murdock
K.D. Thomas
W.N. Matthews
A.C. Williams
T.C. Geer
T.L. McConnell - MNS
R.O. Sharpe - MNS
K.V. Pham - MNS
D.L. Hepler - MNS
T.S. Barr - TTC
QA Tech. Svc. Mgr.
QA Tech. Svc. NRC Coord.
File: MC-801.J1

ATTACHMENT 1

Proposed McGuire Unit 1 and 2 Technical Specifications Changes

Insert for Technical Specification 3/4.8.2

INSERT A

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

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.

SURVEILLANCE REQUIREMENTS

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.

*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.

INSERT A

NO CHANGES THIS PAGE.
FOR INFORMATION
ONLY

SURVEILLANCE REQUIREMENTS (Continued)

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

a. At least once per 7 days by:

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 150×10^{-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 150×10^{-6} ohms; and

4) The battery charger will supply at least 400 amperes at a minimum of 125 volts for at least 1 hour.

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.

NO CHANGES THIS PAGE
FOR INFORMATION
ONLY

SURVEILLANCE REQUIREMENTS (Continued)

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(1)	CATEGORY B(2)	
	LIMITS FOR EACH DESIGNATED PILOT CELL	LIMITS FOR EACH CONNECTED CELL	ALLOWABLE(3) VALUE FOR EACH CONNECTED CELL
Electrolyte Level	>Minimum level indication mark, and ≤ ¼" above maximum level indication mark	>Minimum level indication mark, and ≤ ¼" above maximum level indication mark	Above top of plates, and not overflowing
Float Voltage	≥ 2.13 volts	≥ 2.13 volts(c)	> 2.07 volts
Specific Gravity(a)	≥ 1.200(b)	≥ 1.195	Not more than .020 below the average of all connected cells or ≥ 1.195
		Average of all connected cells > 1.205	Average of all connected cells ≥ 1.195(b)

(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(1)		Category B(2)	Category C(3)
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 ≤ 1/4" above maximum level indication mark		≥ Minimum level indication mark, and ≤ 1/4" above maximum level indication mark	Above top of plates, and not overflowing
Float Voltage	≥ 2.20 Volts		≥ 2.17 Volts(4)	> 2.14 Volts
Specific(5) Gravity	≥ 1.285(6)	CELL	≥ 1.280	Not more than 0.020 below the average of all connected cells or ≥ 1.280
		BATTERY	Average of all connected cells > 1.285(7)	Average of all connected cells ≥ 1.280(6)(7)

(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.

NO CHANGES THIS PAGE.
FOR INFORMATION
ONLY

BASES

3/4.8.1, 3/4.8.2 AND 3/4.8.3 A.C. SOURCES, D.C. SOURCES AND ONSITE POWER DISTRIBUTION SYSTEMS

The OPERABILITY of the A.C. and D.C power sources and associated distribution systems during operation ensures that sufficient power will be available to supply the safety-related equipment required for: (1) the safe shutdown of the facility, and (2) the mitigation and control of accident conditions within the facility. The minimum specified independent and redundant A.C. and D.C. power sources and distribution systems satisfy the requirements of General Design Criterion 17 of Appendix A to 10 CFR 50.

The ACTION requirements specified for the levels of degradation of the power sources provide restriction upon continued facility operation commensurate with the level of degradation. The OPERABILITY of the power sources are consistent with the initial condition assumptions of the safety analyses and are based upon maintaining at least one redundant set of onsite A.C. and D.C. power sources and associated distribution systems OPERABLE during accident conditions coincident with an assumed loss-of-offsite power and single failure of the other onsite A.C. source. The A.C. and D.C. source allowable out-of-service times are based on Regulatory Guide 1.93, "Availability of Electrical Power Sources", December 1974. When one diesel generator is inoperable, there is an additional ACTION requirement to verify that all required systems, subsystems, trains, components and devices, that depend on the remaining OPERABLE diesel generator as a source of emergency power, are also OPERABLE, and that the steam-driven auxiliary feedwater pump is OPERABLE. This requirement is intended to provide assurance that a loss-of-offsite power event will not result in a complete loss of safety function of critical systems during the period one of the diesel generators is inoperable. The term verify as used in this context means to administratively check by examining logs or other information to determine if certain components are out-of-service for maintenance or other reasons. It does not mean to perform the Surveillance Requirements needed to demonstrate the OPERABILITY of the component. The ACTION requirements for diesel generator testing in the event of the inoperability of other electric power sources also reflect the potential for degradation of the diesel generator due to excessive testing. This concern has developed, concurrently with increased industry experience with diesel generators, and has been acknowledged by the NRC staff in Generic Letter 84-15.

The OPERABILITY of the minimum specified A.C. and D.C. power sources and associated distribution systems during shutdown and refueling ensures that: (1) the facility can be maintained in the shutdown or refueling condition for extended time periods, and (2) sufficient instrumentation and control capability is available for monitoring and maintaining the unit status.

The Surveillance Requirements for demonstrating the OPERABILITY of the diesel generators are in accordance with the recommendations of Regulatory Guides 1.9, "Selection of Diesel Generator Set Capacity for Standby Power Supplies," March 10, 1971, 1.108, "Periodic Testing of Diesel Generator Units Used as Onsite Electric Power Systems at Nuclear Power Plants," Revision 1, August 1977, and 1.137, "Fuel-Oil Systems for Standby Diesel Generators," Revision 1, October 1979; also, Generic Letter 84-15, which modified the testing frequencies specified in Regulatory Guide 1.108.

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."

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.

ATTACHMENT 2

Justification and Safety Analysis

Background/Justification:

The 125 VDC Vital Instrumentation and Control Power System provides a source of reliable continuous DC power for safety related control and instrumentation. This 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 power panelboards.

Each of the batteries, designated EVCA, EVCB, EVCC, and EVCD, consists of cells in clear plastic containers with covers, racks, and accessories. During normal operation, the batteries are floated on the buses and assume load without interruption upon loss of a battery charger or AC power source.

Each battery is sized to carry the continuous emergency load of its own vital buses and also assume the loads of another battery in a backup capacity, if required, for a period of one hour. In addition, the battery is capable of supplying power for the operation of anticipated momentary loads during the one hour period.

The batteries and their related accessories are located in separate rooms in the Auxiliary Building which is designed as a Seismic Category I structure, and are thereby protected from station design basis events.

Figure 1 depicts a general illustration of the 125 VDC Vital Instrumentation and Control Power System, including the batteries.

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 NRC IE 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 4.8.2.1.2f. 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. Existing capacity and operability of the vital batteries are not in question at present.

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, however, the capacity increases

that are now seen will diminish at a much accelerated rate. At some point, these aging mechanisms will manifest into unacceptable performance and possibly nonrecoverable cell failure. It is only prudent to anticipate this occurrence and replace the aging battery banks accordingly.

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. With the existing vendor qualification and new replacement cell availability in question, this reinforces the urgency for battery replacement.

Bases/Safety Analysis:

Replacement Battery Characteristics

The battery selected for replacement is the AT&T LINEAGE 2000 Round Cell Battery. This battery (see Figure 2) is a secondary, lead-acid, flooded cell designed by AT&T Bell Laboratories. The specific size (model) selected for McGuire is Model KS-20472, List 1SH (1850 Ampere Hours). Table 1 below lists characteristics of the replacement batteries.

Table 1
Replacement Battery Characteristics

Weight of Cell	352 lbs
Weight of Acid (Vol)	91 lbs (70 pts)
Size	26-3/4" HX x 13-3/4" DIA
Ampere Hour Capacity (8-hr rate @ 77F)	
Nameplate Rating	1850
Estimated Lifetime Capacity	1750
Heat Dissipation during Normal Operation	7.2 micro BTU/hr/cell
Maximum Heat Dissipation	1747 BTU/hr/cell
Recommended Ambient Operating Temperature	77F
Hydrogen Generation during Float Conditions	.094 ft^3/hr for 100 ma/cell
Hydrogen Generation during Equalization	
2.5 volts/cell Equalization	4.72 ft^3/hr
2.25 volts/cell Equalization	2.36 ft^3/hr
Minimum Battery Terminal Voltage	1.5
Nominal Float Voltage	2.25 to 2.27
Specific Gravity	1.3 nominal

The batteries will be installed on AT&T LINEAGE 2000 Battery Stands. These stands are of a polyester-glass construction and were metal-reinforced by the manufacturer to ensure seismic qualification.

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 McGuire 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. Figure 3 depicts the location of the temporary battery and cabling. 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. Current plans are to utilize an AT&T bank as the replacement battery during changeout of the first bank, then utilize the removed Gould bank as the replacement battery during changeout of the remaining three banks. The standby charger/temporary battery combination will be connected to the affected 125 volt bus before its battery is disconnected for removal.

Duke Power Company will develop the 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. Experience at McGuire has shown that this cross-tie can be performed within approximately fifteen minutes.

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 first battery scheduled to be replaced is EVCA. The time that a battery bank is removed from service for replacement will be kept to an absolute minimum. Replacement activities are scheduled for 7-day, 24-hour work coverage. Following is the currently proposed schedule for replacement of battery bank EVCA:

Activity	Schedule
1. Remove battery (isolate power, disconnect cables, disconnect battery interlock, remove battery, disassemble and remove rack)	July 1-3, 1991
2. Remove anchors and repair floor (includes 7 days cure time for concrete)	July 4-12, 1991
3. Install new battery (assemble new rack, install new battery, attach battery interlock and associated hardware)	July 13-17, 1991

4. Connect cables and check system for continuity and ground — July 18-19, 1991

5. Performance testing — July 20-21, 1991

The total duration of the replacement operation is therefore 21 days.

Following the replacement of EVCA, battery EVCC will be replaced. The schedule of replacement activities for EVCC is identical, 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 late March 1992.

Description of Proposed Technical Specifications Changes:

Technical Specification 3/4.8.2 (Limiting Condition for Operation 3.8.2.1) is modified 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 described previously is connected to the respective vital bus. Although current plans are to utilize the standby battery charger EVCS in conjunction with the temporary battery, the footnote is phrased to only specify that a full capacity charger is required. In the unforeseen event that the standby charger becomes unavailable, this would allow the normal charger for that channel to be utilized.

Table 4.8-3 is modified by splitting it into two sections; one for the existing (Gould) cells and another for the replacement (AT&T) cells. This split-table configuration will be maintained until all four battery banks have been replaced.

Since the proposed Technical Specifications changes are temporary changes which will expire when all four vital battery banks have been replaced with new cells, the Bases of the affected Technical Specifications are not being changed to reflect the temporary provisions. The bases for these temporary provisions will be documented via this submittal and the NRC Safety Evaluation Report approving these proposed amendments.

These temporary provisions will expire when all four battery banks have been replaced. At that time, a subsequent Technical Specification change will be submitted to the NRC to delete the footnote concerning the temporary battery and the portion of Table 4.8-3 that pertains to the Gould battery surveillance requirements.

Conclusions:

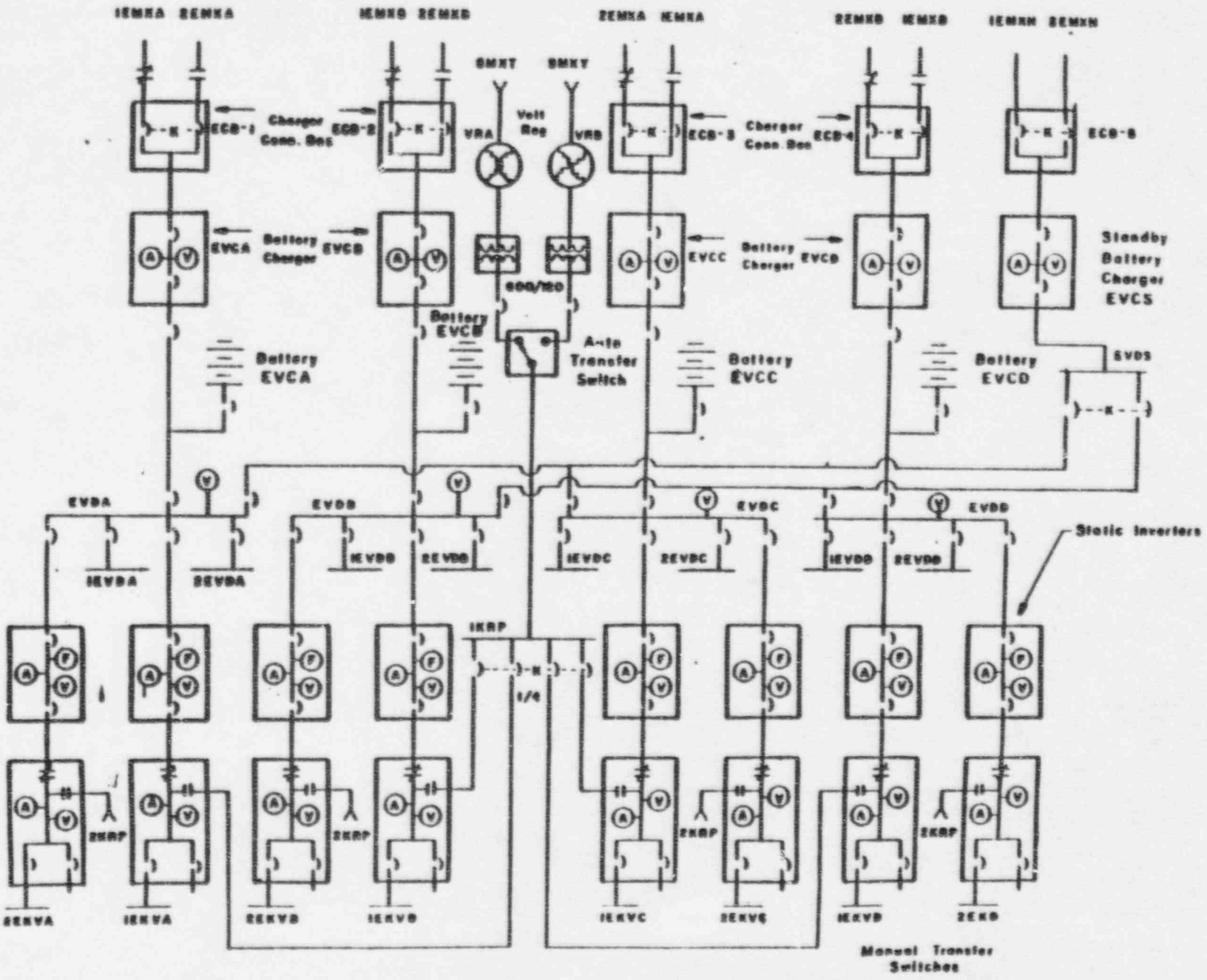
Replacement of the 125 volt DC battery banks at McGuire with cells of an improved and more reliable design will result in a net improvement in plant safety.

During the periods of battery bank replacement, the affected 125 volt bus will remain battery backed through utilization of the aforementioned standby battery charger/temporary battery bank combination. Hence, all

safety-related equipment supplied by the affected distribution center will be battery backed.

Based upon the preceding safety analysis, Duke Power Company concludes that the proposed amendments will not be inimical to the health and safety of company personnel or the public.

Figure 1 - Illustration of McGuire 125 VDC Vital Instrumentation and Control Power System



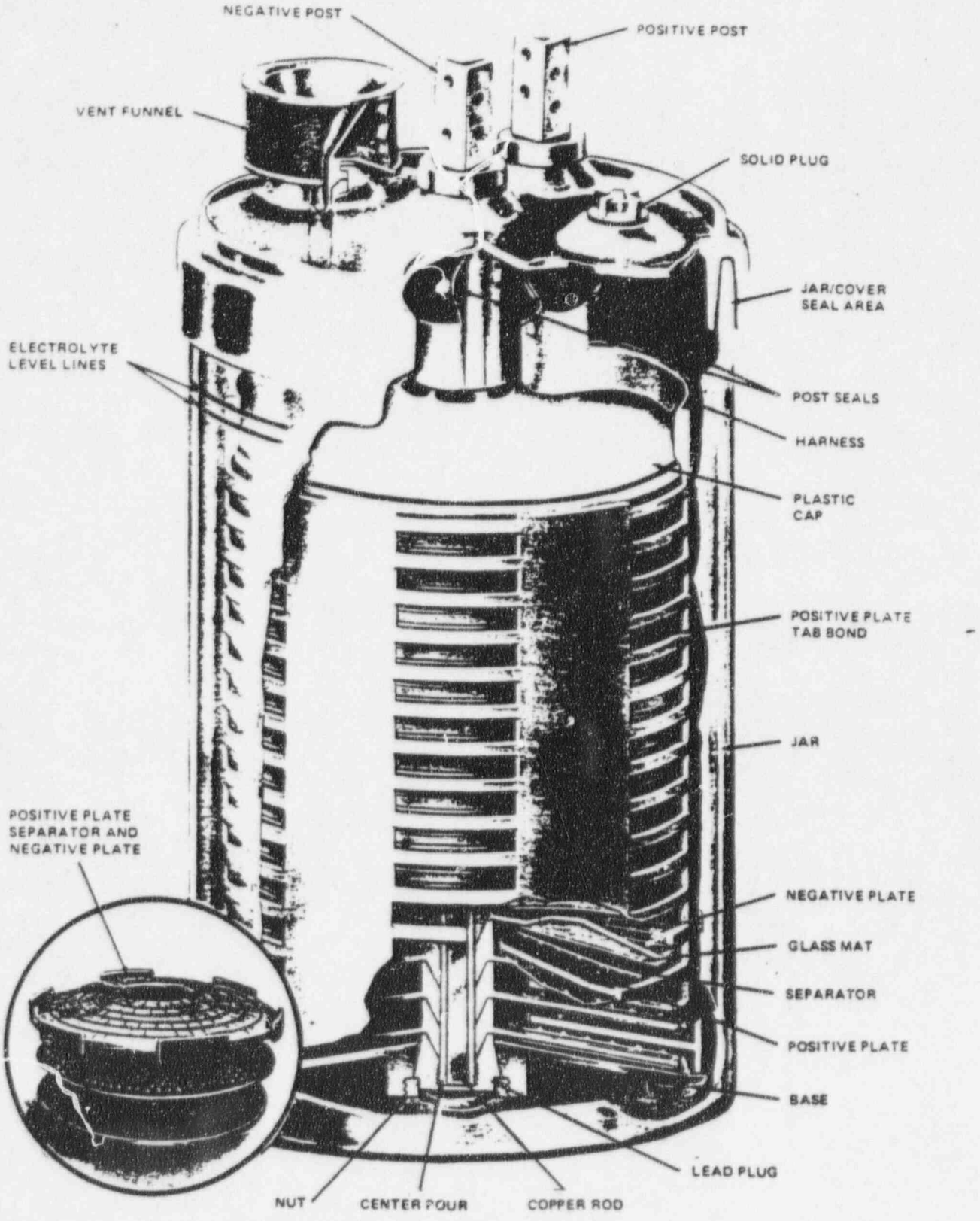
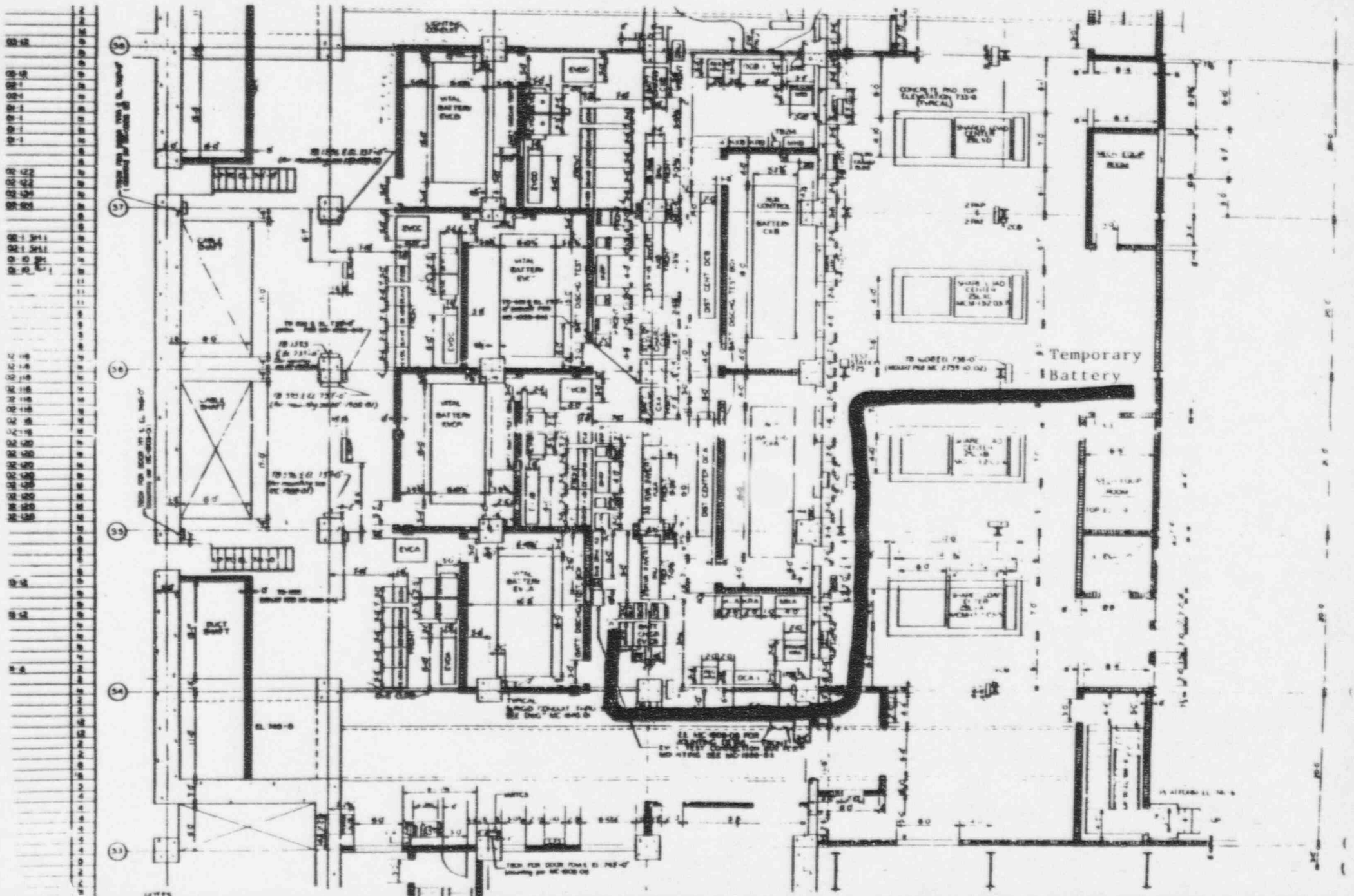


Figure 2 - AT&T LINEAGE 2000 Round Cell Battery (Cutaway View)

Figure 3 - Location of Temporary Battery and Cabling Installation



ATTACHMENT 3

Analysis of Significant Hazards Consideration

Analysis of Significant Hazards Consideration:

Duke Power Company has made the determination that this amendment request involves a no significant hazards consideration by applying the standards established by the Commission's regulation in 10CFR 50.92. This ensures that operation of the facility in accordance with the proposed amendment would not:

(1) involve a significant increase in the probability or consequences of an accident previously evaluated; or

(2) create the possibility of a new or different kind of accident from any accident previously evaluated; or

(3) involve a significant reduction in a margin of safety.

The Commission has provided guidelines pertaining to the application of the three standards by listing specific examples in 48FR14870. Example (vi) relates to a change which either may result in some increase to the probability or consequences of a previously-analyzed accident or may reduce in some way a safety margin, but where the results of the change are clearly within all acceptable criteria with respect to the system or component specified in the Standard Review Plan.

In this case the change proposed by this request is similar to Example (vi) in that Duke Power Company is proposing to replace the existing 125 volt DC battery cells with cells of an improved and more reliable design while utilizing a temporary battery bank during the periods of cell replacement.

The following evaluation measures aspects of this proposal against the Part 50.92(c) requirements to demonstrate that all three standards are satisfied.

First Standard

The amendment would not involve a significant increase in the probability or consequences of an accident previously evaluated.

The 125 Volt DC Vital Instrumentation and Control Power System is not an accident initiator; however, it serves as an accident mitigation system. The replacement batteries are being purchased to meet QA Condition 1 requirements with 10CFR 21 dedication provided by the manufacturer. The new batteries and racks will be seismically mounted. There is no change in cabling required for the new batteries. A fire protection review was performed with no concerns identified. There is no change in the physical and electrical separation provisions for the batteries. The performance of plant safety functions will not be degraded by the new batteries.

Implementation of each battery bank replacement will require three weeks. 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, because no space is available to locate it in the Battery Room in the Auxiliary Building. The Service Building is not a Seismic Category I structure; nevertheless, Duke Power

Company feels that the temporary battery would likely continue to function following a seismic event. The 125 Volt DC Vital Instrumentation and Control Power System will be restored to the fully qualified configuration following each three-week battery replacement period.

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.

The ability to cross-tie the electrical buses for the batteries by manual action remains available as 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.

The ambient temperature surrounding the temporary battery will be periodically monitored to ensure it remains within battery specifications. Available ventilation is sufficient to prevent accumulation of excess hydrogen.

For the above reasons, neither the new replacement batteries nor the temporary battery installation involves a significant increase in the probability or consequences of an accident previously evaluated.

Second Standard

The amendment would not create the possibility of a new or different kind of accident from any kind of accident previously evaluated.

There are no new or common failure modes created by the new batteries. The new batteries perform the same function as the existing batteries. The existing batteries are approaching the end of their useful life; therefore, the new batteries are expected to be more reliable than the existing ones.

The temporary backup battery will be a new battery for the first replacement operation, and for each subsequent replacement, it will be a replaced battery. In either case, the temporary battery and rack will be the same qualified equipment as normally used. There are no new failure modes created for the batteries and associated distribution equipment not involved in the particular changeout operation. With the temporary battery connected, there are no new failure modes for the distribution equipment associated with the battery being replaced. The new failure mode for the temporary battery installation as a result of it not being fully seismically qualified is considered insignificant, due to the short duration for which the temporary configuration will be used. Duke Power Company has evaluated the temporary battery configuration from a probabilistic risk standpoint and has found that the temporary battery has no significant impact on the overall core melt frequency at McGuire.

For these reasons, the possibility of a new or different kind of accident from any kind of accident previously evaluated is not created.

Third Standard

The amendment would not involve a significant reduction in a margin of safety.

The vital batteries are required to power the emergency diesel generator load sequencers during certain accident conditions. Ultimately, safety-related equipment required to maintain the integrity of fission product barriers can depend upon proper performance of the sequencers, and therefore, the batteries. For the replacement batteries, no fission product barriers are affected by the battery changeout. Also, the temporary battery installation does not affect any fission product barriers. All required procedures and training governing operation with the temporary battery in place will be developed and implemented prior to conducting battery replacement. During the periods 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.

For these reasons, the amendment does not involve a significant reduction in any safety margin.

Based on the above and the supporting technical justification, Duke Power Company has concluded that there is no significant hazard consideration involved in this amendment request.

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

July 1, 1991

Docket Nos. 50-369
and 50-370

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
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

Mr. M.S. Tuckman
Duke Power Company

McGuire Nuclear Station

cc:
Mr. A.V. Carr, Esq.
Duke Power Company
422 South Church Street
Charlotte, North Carolina 28242-0001

County Manager of Mecklenburg County
720 East Fourth Street
Charlotte, North Carolina 28202

Mr. Paul Guill
Duke Power Company
Nuclear Production Department
P.O. Box 1007
Charlotte, North Carolina 28201-1007

J. Michael McGarry, III, Esq.
Winston and Strawn
1400 L Street, N.W.
Washington, DC 20005

Senior Resident Inspector
c/o U.S. Nuclear Regulatory Commission
12700 Hagers Ferry Road
Huntersville, North Carolina 28078

Regional Administrator, Region II
U.S. Nuclear Regulatory Commission
101 Marietta Street, N.W., Suite 2900
Atlanta, Georgia 30323

Mr. Frank Modrak
Project Manager, Mid-South Area
ESSD Projects
Westinghouse Electric Corporation
MNC West Tower - Bay 241
P. O. Box 355
Pittsburgh, Pennsylvania 15230

Dr. John M. Barry
Department of Environmental Health
Mecklenburg County
1200 Blythe Boulevard
Charlotte, North Carolina 28203

Mr. Dayne H. Brown, Director
Department of Environmental,
Health and Natural Resources
Division of Radiation Protection
P.O. Box 27687
Raleigh, North Carolina 27611-7687

Mr. Alan R. Herdt, Chief
Project Branch #3
U.S. Nuclear Regulatory Commission
101 Marietta Street, NW, Suite 2900
Atlanta, Georgia 30323

Ms. Karen E. Long
Assistant Attorney General
N. C. Department of Justice
P.O. Box 629
Raleigh, North Carolina 27602

Mr. R.L. Gill, Jr.
Nuclear Production Department
Duke Power Company
P.O. Box 1007
Charlotte, North Carolina 28201-1007

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

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 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.

SURVEILLANCE REQUIREMENTS

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 150×10^{-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 150×10^{-6} ohms, and

4) The battery charger will supply at least 400 amperes at a minimum of 125 volts for at least 1 hour.

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, 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(1) LIMITS FOR EACH DESIGNATED PILOT CELL	CATEGORY B(2) LIMITS FOR EACH CONNECTED CELL	CATEGORY B(2) ALLOWABLE(3) VALUE FOR EACH CONNECTED CELL
Electrolyte Level	>Minimum level indication mark, and ≤ ¼" above maximum level indication mark	>Minimum level indication mark, and ≤ ¼" above maximum level indication mark	Above top of plates, and not overflowing
Float Voltage	≥ 2.13 volts	≥ 2.13 volts(c)	> 2.07 volts
Specific Gravity(a)	≥ 1.200(b)	≥ 1.195 Average of all connected cells > 1.205	Not more than .020 below the average of all connected cells or ≥ 1.195 Average of all connected cells ≥ 1.195(b)

(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(1)		Category B(2)	Category C(3)
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 ≤ 1/4" above maximum level indication mark		≥ Minimum level indication mark, and ≤ 1/4" above maximum level indication mark	Above top of plates, and not overflowing
Float Voltage	≥ 2.20 Volts		≥ 2.17 Volts(4)	> 2.14 Volts
Specific(5) Gravity	≥ 1.285(6)	CELL	≥ 1.280	Not more than 0.020 below the average of all connected cells or ≥ 1.280
		BATTERY	Average of all connected cells > 1.285(7)	Average of all connected cells ≥ 1.280(6)(7)

(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