March 4, 1994

Docket Nos. STN 50-454, STN 50-455
and STN 50-456, STN 50-457

Mr. D. L. Farrar, Manager
Nuclear Regulatory Services
Commonwealth Edison Company
Executive Towers West III, Suite 500
1400 OPUS Place
Downers Grove, Illinois 60515

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Dear Mr. Farrar:

SUBJECT: ISSUANCE OF AMENDMENTS (TAC NOS. M87756, M87757, M87758, AND M87759)

The Commission has issued the enclosed Amendment No. 59 to Facility Operating License No. NPF-37 and Amendment No. 59 to Facility Operating License No. NPF-66 for the Byron Station, Unit Nos. 1 and 2, respectively, and Amendment No. 47 to Facility Operating License No. NPF-72 and Amendment No. 47 to Facility Operating License No. NPF-77 for the Braidwood Station, Unit Nos. 1 and 2, respectively. The amendments are in response to your application dated September 2, 1993, supplemented by submittals dated January 7, 1994 and February 10, 1994.

The amendments revise the Byron and Braidwood Technical Specifications (TS) to allow replacement of the 125 volt DC Gould batteries with new 125 volt DC AT&T batteries and rephrase the specification for their design duty cycle. In addition, the amendments revise the crosstie loading limitations and crosstie breaker limitations. The associated TS Bases are also revised to include the purpose for the crosstie limitations and a discussion of the design duty cycle requirements.

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

Sincerely,

Original signed by:

Ramin R. Assa, Acting Project Manager
Project Directorate III-2
Division of Reactor Projects - III/IV/V
Office of Nuclear Reactor Regulation

Enclosures:
1. Amendment No. 59 to NPF-37
2. Amendment No. 59 to NPF-66
3. Amendment No. 47 to NPF-72
4. Amendment No. 47 to NPF-77
5. Safety Evaluation

cc w/enclosures:
See next page

CP-1

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OFC	LA:PDIII-2	I:PDIII-2	PM:PDIII-2	PM:PDIII-2	D:PDIII-2	OGC
NAME	TCLARK	JDAWSON	RASSA	GDICK	JDYER	
DATE	2/18/94	/94	2/23/94	2/24/94	3/4/94	2/27/94
COPY	YES/NO	YES/NO	YES/NO	YES/NO	YES/NO	/NO

Reissued 03/09/94

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

COMMONWEALTH EDISON COMPANY

DOCKET NO. STN 50-454

BYRON STATION, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 59
License No. NPF-37

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

   A. The application for amendment by Commonwealth Edison Company (the licensee) dated September 2, 1993, supplemented by submittals dated January 7, 1994, and February 10, 1994, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's rules and regulations 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;

   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 amended by 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-37 is hereby amended to read as follows:

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(2) Technical Specifications

The Technical Specifications contained in Appendix A as revised through Amendment No. 59 and the Environmental Protection Plan contained in Appendix B, both of which are attached hereto, are hereby incorporated into this license. The licensee shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

James E. Dyer, Director
Project Directorate III-2
Division of Reactor Projects - III/IV/V
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: March 4, 1994

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

COMMONWEALTH EDISON COMPANY

DOCKET NO. STN 50-455

BYRON STATION, UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 59
License No. NPF-66

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

   A. The application for amendment by Commonwealth Edison Company (the licensee) dated September 2, 1993, supplemented by submittals dated January 7, 1994, and February 10, 1994, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's rules and regulations set forth in 10 CFR Chapter 1;

   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;

   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 amended by 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-66 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A (NUREG-1113), as revised through Amendment No. 59 and revised by Attachment 2 to NPF-66, and the Environmental Protection Plan contained in Appendix B, both of which were attached to License No. NPF-37, dated February 14, 1985, are hereby incorporated into this license. Attachment 2 contains a revision to Appendix A which is hereby incorporated into this license. The licensee shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

James E. Dyer

James E. Dyer, Director
Project Directorate III-2
Division of Reactor Projects - III/IV/V
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: March 4, 1994

ATTACHMENT TO LICENSE AMENDMENT NOS. 59 AND 59

FACILITY OPERATING LICENSE NOS. NPF-37 AND NPF-66

DOCKET NOS. STN 50-454 AND STN 50-455

Revise the Appendix A Technical Specifications by removing the pages identified below and inserting the attached pages. The revised pages are identified by the captioned amendment number and contain marginal lines indicating the area of change.

Remove Pages	Insert Pages
3/4 8-10	3/4 8-10
3/4 8-11	3/4 8-11
3/4 8-11a	3/4 8-11a
3/4 8-12	3/4 8-12
-	3/4 8-12a
3/4 8-13	3/4 8-13
B 3/4 8-2	B 3/4 8-2

3/4.8.2 D.C. SOURCES

OPERATING

LIMITING CONDITION FOR OPERATION

3.8.2.1 As a minimum the following D.C. electrical sources shall be OPERABLE:

a. 125-Volt D.C. Bus 111 fed from Battery 111 for Unit 1 (Bus 211 fed from Battery 211 for Unit 2) and its associated full capacity charger, and with one of its associated crosstie breakers in the open position, and

b. 125-Volt D.C. Bus 112 fed from Battery 112 for Unit 1 (Bus 212 fed from Battery 212 for Unit 2) and its associated full capacity charger, and with one of its associated crosstie breakers in the open position.

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

ACTION:

a. With one of the required 125-Volt D.C. buses inoperable due to its normal associated full capacity charger being inoperable, operations may continue provided that within 2 hours the inoperable bus and its associated battery are energized by the opposite unit's 125-Volt D.C. bus and its OPERABLE charger via the crosstie breakers and that within 24 hours the inoperable bus and its charger are restored to OPERABLE status. Otherwise be in at least HOT STANDBY within the next 6 hours and COLD SHUTDOWN within the following 30 hours.

b. With both of the crosstie breakers closed for a 125-Volt D.C. bus that is required to be OPERABLE and with both units operating (Modes 1, 2, 3, or 4), the 125-Volt D.C. bus may energize the opposite unit's inoperable 125-Volt D.C. bus having an inoperable charger without a load restriction.

c. With both of the crosstie breakers closed for a 125-Volt D.C. bus that is required to be OPERABLE and with the opposite unit shutdown (Modes 5, 6, or defueled), the crosstie breakers may remain closed for up to 7 days provided items 1 and 2 below are satisfied. Otherwise open one of the crosstie breakers.

(1) The shutdown unit's bus load is restricted to:

Shutdown Unit Battery Status	Operating Unit Battery Type	Load Restriction
Inoperable	AT&T	100 Amps
Inoperable	Gould	63 Amps
OPERABLE	Either	None

(2) If a load restriction applies, then once per 12 hours verify that the shutdown unit's bus loading will not exceed the load restriction.

d. With one of the required 125-Volt D.C. buses inoperable, except for the allowances of ACTIONS (a), (b), or (c) above, restore the inoperable bus to OPERABLE 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.

SURVEILLANCE REQUIREMENTS

4.8.2.1.1 Each D.C. bus shall be determined OPERABLE and energized from its battery at least once per 7 days by verifying correct breaker alignment.

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

a. At least once per 7 days by verifying that:

1) The parameters in Table 4.8-2 meet the Category A limits, and

2) The total battery terminal voltage is greater than or equal to 130.5 volts (AT&T) 126 volts (Gould) on float charge.

b. At least once per 92 days and within 7 days after a battery discharge with battery terminal voltage below 110 volts, or battery overcharge with battery terminal voltage above 145 volts, by verifying that:

1) The parameters in Table 4.8-2 meet the Category B limits,

2) There is no visible corrosion at either terminals or connectors, or the connection resistance of these items is less than 150×10^{-6} ohm*, and

3) The average electrolyte temperature of all connected cells is above 60°F.

c. At least once per 18 months by verifying that:

1) The cells, cell plates, 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 anticorrosion material,

3) The resistance of each cell-to-cell and terminal connection is less than or equal to 150×10^{-6} ohm*, and

4) The battery charger will supply a load equal to the manufacturer's rating for at least 8 hours.

d. At least once per 18 months, during shutdown, by verifying that the battery capacity is adequate to supply and maintain in OPERABLE status all of the actual or simulated emergency loads for the design duty cycle when the battery is subject to a battery service test;

*Obtained by subtracting the normal resistance of: 1) the cross room rack connector (Gould only: 400×10^{-6} ohm, typical) and 2) the bi-level rack connector (both AT&T and Gould: 50×10^{-6} ohm, typical); from the measured cell-to-cell connection resistance.

e. At least once per 60 months, during shutdown, by verifying that the battery capacity is at least 95% (AT&T) 80% (Gould) of the manufacturer's rating when subjected to a performance discharge test or a modified performance discharge test. The modified performance discharge test (AT&T) and the performance discharge test (Gould) may be performed in lieu of the battery service test required by Specification 4.8.2.1.2d.;

f. At least once per 18 months during shutdown, by giving performance discharge tests or modified performance discharge tests of battery capacity 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 5% (AT&T) 10% (Gould) of rated capacity from its capacity on the previous performance test or modified performance test, or is below 100% (AT&T) 90% (Gould) of the manufacturer's rating.

TABLE 4.8-2 ('^T&T)

BATTERY SURVEILLANCE REQUIREMENTS

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	≥ 2.18 volts	≥ 2.18 volts[6]	> 2.14 volts
Specific Gravity[4]	≥ 1.285[5]	≥ 1.280	Not more than 0.020 below the average of all connected cells
		Average of all connected cells	Average of all connected cells
		> 1.290	≥ 1.280[5]

TABLE NOTATIONS

(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 A and 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.
(4) Corrected for electrolyte temperature and level.
(5) Or battery charging current is less than 2 amps when on charge.
(6) Corrected for average electrolyte temperature.

TABLE 4.8-2 (CONTINUED)

BATTERY SURVEILLANCE REQUIREMENTS

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[6]	> 2.07 volts
Specific Gravity[4]	≥ 1.200[5]	≥ 1.195	Not more than 0.020 below the average of all connected cells
		Average of all connected cells	Average of all connected cells
		> 1.205	≥ 1.195[5]

TABLE NOTATIONS

(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 A and 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.
(4) Corrected for electrolyte temperature and level.
(5) Or battery charging current is less than 2 amps when on charge.
(6) Corrected for average electrolyte temperature.

LIMITING CONDITION FOR OPERATION

3.8.2.2 As a minimum, one 125-volt D.C. bus fed from its battery and its associated full-capacity charger and with one of its associated crosstie breakers in the open position shall be OPERABLE.

APPLICABILITY: MODES 5 and 6.

ACTION:

a. With both of the crosstie breakers closed for the 125-Volt D.C. bus that is required to be OPERABLE and with the opposite unit operating (Modes 1, 2, 3, or 4), the shutdown unit's operable 125-Volt D.C. bus may energize the operating unit's inoperable 125-Volt D.C. bus having an inoperable charger without a load restriction.

b. With both of the crosstie breakers closed for the 125-Volt D.C. bus that is required to be OPERABLE and with both units shutdown (Modes 5, 6, or defueled), the 125-Volt D.C. bus may energize the opposite unit's 125-Volt D.C. bus for up to 7 days provided items 1 and 2 below are satisfied. Otherwise open one of the crosstie breakers.

   (1) The opposite unit's bus load is restricted to:

Opposite Bus Battery Status	Operable Bus Battery Type	Load Restriction
Inoperable	AT&T	100 Amps
Inoperable	Gould	63 Amps
OPERABLE	Either	None

   (2) If a load restriction applies, then once per 12 hours verify that the opposite shutdown unit's bus loading will not exceed the load restriction.

c. With the required 125-Volt D.C. bus inoperable, except for the allowances of ACTIONS (a) or (b) above, immediately suspend all operations involving CORE ALTERATIONS, positive reactivity additions, or movement of irradiated fuel; initiate corrective action to restore the required bus to OPERABLE status as soon as possible; and within 8 hours, depressurize and vent the Reactor Coolant System through at least a 2 square inch vent.

SURVEILLANCE REQUIREMENTS

4.8.2.2 The above required 125-volt D.C. bus fed from its battery and its associated charger shall be demonstrated OPERABLE per Specifications 4.8.2.1.1 and 4.8.2.1.2.

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

The Surveillance Requirement for demonstrating the OPERABILITY of the station batteries is 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."

The modified performance discharge test is described in the April 24, 1992 Draft Revision to IEEE Std 450, "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Vented Lead-Acid Batteries for Stationary Applications." It is permissible to perform a modified performance discharge test on the AT&T battery in lieu of a service test and a performance discharge test as required by Regulatory Guide 1.129, Regulatory Position C.1, because the test discharge rate envelopes the load cycle of the service test.

Verification of the crosstie loading limits in Specifications 3.8.2.1 and 3.8.2.2 ensures that the OPERABLE battery will have sufficient capacity to energize the design basis loads of its DC bus while maintaining the limited DC loads of the inoperable DC bus on a shutdown unit.

Verifying average electrolyte temperature above the minimum for which the battery was sized, total battery terminal voltage on float charge, 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.

The battery service test is a special test of battery capability, as-found, to satisfy the design requirements (battery duty cycle) of the D.C. electrical power system. The discharge rate and length of the battery service test corresponds to the design duty cycle requirements as specified in UFSAR Subsection 8.3.2.1.1.

Table 4.8-2 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 2.18 volts (AT&T) 2.13 volts (Gould) 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 2.18 volts (AT&T) 2.13 volts (Gould) 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 4.8-2 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 2.14 volts (AT&T) 2.07 volts (Gould), ensures the battery's capability to perform its design function.

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

COMMONWEALTH EDISON COMPANY

DOCKET NO. STN 50-456

BRAIDWOOD STATION, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 47
License No. NPF-72

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

   A. The application for amendment by Commonwealth Edison Company (the licensee) dated September 2, 1993, supplemented by submittals dated January 7, 1994, and February 10, 1994, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's rules and regulations 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;

   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 amended by 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-72 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A as revised through Amendment No. 47 and the Environmental Protection Plan contained in Appendix B, both of which are attached hereto, are hereby incorporated into this license. The licensee shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

James E. Dyer

James E. Dyer, Director
Project Directorate III-2
Division of Reactor Projects - III/IV/V
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: March 4, 1994

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

COMMONWEALTH EDISON COMPANY

DOCKET NO. STN 50-457

BRAIDWOOD STATION, UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 47
License No. NPF-77

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

   A. The application for amendment by Commonwealth Edison Company (the licensee) dated September 2, 1993, supplemented by submittals dated January 7, 1994, and February 10, 1994, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's rules and regulations set forth in 10 CFR Chapter 1;

   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;

   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 amended by 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-77 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A as revised through Amendment No. 47 and the Environmental Protection Plan contained in Appendix B, both of which were attached to License No. NPF-72, dated July 2, 1987, are hereby incorporated into this license. The licensee shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of the date if its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

James E. Dyer

James E. Dyer, Director
Project Directorate III-2
Division of Reactor Projects - III/IV/V
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: March 4, 1994

ATTACHMENT TO LICENSE AMENDMENT NOS. 47 AND 47

FACILITY OPERATING LICENSE NOS. NPF-72 AND NPF-77

DOCKET NOS. STN 50-456 AND STN 50-457

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

Remove Pages	Insert Pages
3/4 8-10	3/4 8-10
3/4 8-11	3/4 8-11
3/4 8-11a	3/4 8-11a
3/4 8-12	3/4 8-12
-	3/4 8-12a
3/4 8-13	3/4 8-13
B 3/4 8-2	B 3/4 8-2

3/4.8.2 D.C. SOURCES

OPERATING

LIMITING CONDITION FOR OPERATION

3.8.2.1 As a minimum the following D.C. electrical sources shall be OPERABLE:

a. 125-Volt D.C. Bus 111 fed from Battery 111 for Unit 1 (Bus 211 fed from Battery 211 for Unit 2) and its associated full capacity charger, and with one of its associated crosstie breakers in the open position, and

b. 125-Volt D.C. Bus 112 fed from Battery 112 for Unit 1 (Bus 212 fed from Battery 212 for Unit 2) and its associated full capacity charger, and with one of its associated crosstie breakers in the open position.

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

ACTION:

a. With one of the required 125-Volt D.C. buses inoperable due to its normal associated full capacity charger being inoperable, operations may continue provided that within 2 hours the inoperable bus and its associated battery are energized by the opposite unit's 125-Volt D.C. bus and its OPERABLE charger via the crosstie breakers and that within 24 hours the inoperable bus and its charger are restored to OPERABLE status. Otherwise be in at least HOT STANDBY within the next 6 hours and COLD SHUTDOWN within the following 30 hours.

b. With both of the crosstie breakers closed for a 125-Volt D.C. bus that is required to be OPERABLE and with both units operating (Modes 1, 2, 3, or 4), the 125-Volt D.C. bus may energize the opposite unit's inoperable 125-Volt D.C. bus having an inoperable charger without a load restriction.

c. With both of the crosstie breakers closed for a 125-Volt D.C. bus that is required to be OPERABLE and with the opposite unit shutdown (Modes 5, 6, or defueled), the crosstie breakers may remain closed for up to 7 days provided items 1 and 2 below are satisfied. Otherwise open one of the crosstie breakers.

(1) The shutdown unit's bus load is restricted to:

Shutdown Unit Battery Status	Operating Unit Battery Type	Load Restriction
Inoperable	AT&T	100 Amps
Inoperable	Gould	63 Amps
OPERABLE	Either	None

(2) If a load restriction applies, then once per 12 hours verify that the shutdown unit's bus loading will not exceed the load restriction.

d. With one of the required 125-Volt D.C. buses inoperable, except for the allowances of ACTIONS (a), (b), or (c) above, restore the inoperable bus to OPERABLE 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.

SURVEILLANCE REQUIREMENTS

4.8.2.1.1 Each D.C. bus shall be determined OPERABLE and energized from its battery at least once per 7 days by verifying correct breaker alignment.

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

a. At least once per 7 days by verifying that:

1) The parameters in Table 4.8-2 meet the Category A limits, and

2) The total battery terminal voltage is greater than or equal to 130.5 volts (AT&T) 126 volts (Gould) on float charge.

b. At least once per 92 days and within 7 days after a battery discharge with battery terminal voltage below 110 volts, or battery overcharge with battery terminal voltage above 145 volts, by verifying that:

1) The parameters in Table 4.8-2 meet the Category B limits,

2) There is no visible corrosion at either terminals or connectors, or the connection resistance of these items is less than 150×10^{-6} ohm*, and

3) The average electrolyte temperature of all connected cells is above 60°F.

c. At least once per 18 months by verifying that:

1) The cells, cell plates, 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 anticorrosion material,

3) The resistance of each cell-to-cell and terminal connection is less than or equal to 150×10^{-6} ohm*, and

4) The battery charger will supply a load equal to the manufacturer's rating for at least 8 hours.

d. At least once per 18 months, during shutdown, by verifying that the battery capacity is adequate to supply and maintain in OPERABLE status all of the actual or simulated emergency loads for the design duty cycle when the battery is subject to a battery service test;

*Obtained by subtracting the normal resistance of: 1) the cross room rack connector (Gould only: 400×10^{-6} ohm, typical) and 2) the bi-level rack connector (both AT&T and Gould: 50×10^{-6} ohm, typical); from the measured cell-to-cell connection resistance.

e. At least once per 60 months, during shutdown, by verifying that the battery capacity is at least 95% (AT&T) 80% (Gould) of the manufacturer's rating when subjected to a performance discharge test or a modified performance discharge test. The modified performance discharge test (AT&T) and the performance discharge test (Gould) may be performed in lieu of the battery service test required by Specification 4.8.2.1.2d.;

f. At least once per 18 months during shutdown, by giving performance discharge tests or modified performance discharge tests of battery capacity 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 5% (AT&T) 10% (Gould) of rated capacity from its capacity on the previous performance test or modified performance test, or is below 100% (AT&T) 90% (Gould) of the manufacturer's rating.

TABLE 4.8-2 (AT&T)

BATTERY SURVEILLANCE REQUIREMENTS

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	≥ 2.18 volts	≥ 2.18 volts[6]	> 2.14 volts
Specific Gravity[4]	≥ 1.285[5]	≥ 1.280	Not more than 0.020 below the average of all connected cells
		Average of all connected cells	Average of all connected cells
		> 1.290	≥ 1.280[5]

TABLE NOTATIONS

(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 A and 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.
(4) Corrected for electrolyte temperature and level.
(5) Or battery charging current is less than 2 amps when on charge.
(6) Corrected for average electrolyte temperature.

TABLE 4.8-2 (GOULD)

BATTERY SURVEILLANCE REQUIREMENTS

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[6]	> 2.07 volts
Specific Gravity[4]	≥ 1.200[5]	≥ 1.195	Not more than 0.020 below the average of all connected cells
		Average of all connected cells	Average of all connected cells
		> 1.205	≥ 1.195[5]

TABLE NOTATIONS

(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 A and 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.

(4) Corrected for electrolyte temperature and level.

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

(6) Corrected for average electrolyte temperature.

LIMITING CONDITION FOR OPERATION

3.8.2.2 As a minimum, one 125-volt D.C. bus fed from its battery and its associated full-capacity charger and with one of its associated crosstie breakers in the open position shall be OPERABLE.

APPLICABILITY: MODES 5 and 6.

ACTION:

a. With both of the crosstie breakers closed for the 125-Volt D.C. bus that is required to be OPERABLE and with the opposite unit operating (Modes 1, 2, 3, or 4), the shutdown unit's operable 125-Volt D.C. bus may energize the operating unit's inoperable 125-Volt D.C. bus having an inoperable charger without a load restriction.

b. With both of the crosstie breakers closed for the 125-Volt D.C. bus that is required to be OPERABLE and with both units shutdown (Modes 5, 6, or defueled), the 125-Volt D.C. bus may energize the opposite unit's 125-Volt D.C. bus for up to 7 days provided items 1 and 2 below are satisfied. Otherwise open one of the crosstie breakers.

   (1) The opposite unit's bus load is restricted to:

Opposite Bus Battery Status	Operable Bus Battery Type	Load Restriction
Inoperable	AT&T	100 Amps
Inoperable	Gould	63 Amps
OPERABLE	Either	None

   (2) If a load restriction applies, then once per 12 hours verify that the opposite shutdown unit's bus loading will not exceed the load restriction.

c. With the required 125-Volt D.C. bus inoperable, except for the allowances of ACTIONS (a) or (b) above, immediately suspend all operations involving CORE ALTERATIONS, positive reactivity additions, or movement of irradiated fuel; initiate corrective action to restore the required bus to OPERABLE status as soon as possible; and within 8 hours, depressurize and vent the Reactor Coolant System through at least a 2 square inch vent.

SURVEILLANCE REQUIREMENTS

4.8.2.2 The above required 125-volt D.C. bus fed from its battery and its associated charger shall be demonstrated OPERABLE per Specifications 4.8.2.1.1 and 4.8.2.1.2.

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

The Surveillance Requirement for demonstrating the OPERABILITY of the station batteries is 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."

The modified performance discharge test is described in the April 24, 1992 Draft Revision to IEEE Std 450, "IEEE Recommended Practice for Maintenance, Testing and Replacement of Vented Lead-Acid Batteries for Stationary Applications." It is permissible to perform a modified performance discharge test on the AT&T battery in lieu of a service test and a performance discharge test as required by Regulatory Guide 1.129, Regulatory Position C.1, because the test discharge rate envelopes the load cycle of the service test.

Verification of the crosstie loading limits in Specifications 3.8.2.1 and 3.8.2.2 ensures that the OPERABLE battery will have sufficient capacity to energize the design basis loads of its DC bus while maintaining the limited DC loads of the inoperable DC bus on a shutdown unit.

Verifying average electrolyte temperature above the minimum for which the battery was sized, total battery terminal voltage on float charge, 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.

The battery service test is a special test of battery capability, as-found, to satisfy the design requirements (battery duty cycle) of the D.C. electrical power system. The discharge rate and length of the battery service test corresponds to the design duty cycle requirements as specified in UFSAR Subsection 8.3.2.1.1.

Table 4.8-2 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 2.18 volts (AT&T) 2.13 volts (Gould) 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 2.18 volts (AT&T) 2.13 volts (Gould) 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 4.8-2 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 2.14 volts (AT&T) 2.07 volts (Gould), ensures the battery's capability to perform its design function.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 59 TO FACILITY OPERATING LICENSE NO. NPF-37,

AMENDMENT NO. 59 TO FACILITY OPERATING LICENSE NO. NPF-66,

AMENDMENT NO. 47 TO FACILITY OPERATING LICENSE NO. NPF-72,

AND AMENDMENT NO. 47 TO FACILITY OPERATING LICENSE NO. NPF-77

COMMONWEALTH EDISON COMPANY

BYRON STATION, UNIT NOS. 1 AND 2

BRAIDWOOD STATION, UNIT NOS. 1 AND 2

DOCKET NOS. STN 50-454, STN 50-455, STN 50-456 AND STN 50-457

1.0 INTRODUCTION

By letters dated September 2, 1993 and January 7, 1994, Commonwealth Edison (the licensee) proposed replacement of the existing 125 VDC Gould batteries with new 125 VDC AT&T batteries. This replacement was proposed because the existing Gould batteries are approaching the 85% service life limit. In accordance with this change, the licensee requested an amendment to revise Technical Specification (TS) 3/4.8.2 - DC Sources, and the associated Bases, to reflect the AT&T battery parameters which are different from those of the Gould battery. In addition, changes to other portions of TS 3/4.8.2 were requested. These changes consist of restatement of the design duty cycle, restatement of the crosstie breaker limitation, and revision of the crosstie loading limitation.

A meeting between the NRC staff and the licensee was held on February 1, 1994, to resolve NRC staff concerns raised during telephone conversations of January 18, 1994 and January 24, 1994. The licensee formally resolved these concerns in a supplemental submittal dated February 10, 1994. Information in this submittal had no impact on the original no significant hazards consideration.

2.0 EVALUATION

Following is the staff's evaluation of the proposed TS changes:

1. Battery Replacement Changes

The licensee has proposed to replace the existing 125 VDC Gould batteries with the AT&T batteries. The replacement batteries are being purchased to meet the design, functional, and qualification requirements

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of the current batteries and, therefore, the performance of plant safety functions will not be degraded by the new batteries. As a result of replacing the batteries, the licensee has proposed to modify Table 4.8.2 of the TS by splitting it into two separate tables; one table for the existing Gould batteries and another for the replacement AT&T batteries. These tables reflect some of the parameters (e.g., specific gravity, float voltage per cell) of the AT&T batteries which are different from those of the Gould batteries. The separate tables will be maintained to allow for the transition period needed to install the AT&T batteries. The licensee also added the AT&T battery operational float voltage limits per cell in the Bases Section. These changes are acceptable.

The staff was concerned as to whether the electrical equipment and the cables would be able to handle the higher rating of the AT&T batteries. In the telephone conversation on January 18, 1994, the licensee confirmed that all the electrical equipment is rated to carry higher current. The cable sizes are 350 MCM and the breakers are rated at 600 amp with an interrupting capacity of 22,000 amps. The staff finds this acceptable.

The licensee has also proposed a change to Specification 4.8.2.1.2.a.2 to add a total battery terminal float charger voltage limit of greater than or equal to 130.5 volts for the AT&T battery while still retaining the voltage limit of greater than or equal to 126 volts for the Gould battery. The higher battery terminal float charger voltage limit for the AT&T battery is due to the higher volts per cell of 2.25 to 2.27 volts for the AT&T batteries. The staff finds this acceptable.

In addition, the licensee has proposed a change to the "*" notation for Specifications 4.8.2.1.2.b.2 and 4.8.2.1.2.c.3 reflecting the configuration differences of rack arrangement between the Gould battery and the AT&T battery. Both batteries have bi-level rack of cells, but only the Gould battery has cross-room racks. This change is acceptable.

In their September 2, 1993, submittal, the licensee proposed a design margin of 15% for the AT&T batteries, which was in accordance with IEEE-485 for sizing large lead-acid batteries. During re-evaluation, the licensee found that there was only a 5% design margin. Since an aging factor of 1.25 is used for the AT&T batteries, instead of 1.0, the staff finds this change acceptable.

The licensee had not proposed any changes to the Surveillance Requirements for AT&T batteries in 4.8.2.1.2.e and 4.8.2.1.2.f. The existing Surveillance Requirements in 4.8.2.1.2.e and 4.8.2.1.2.f were written for lead-calcium and lead-antimony rectangular cell batteries which show a capacity loss over time. Since the IEEE Standards were not written for the AT&T round cell batteries, for which the capacity increases with time, the staff determined that 80% replacement criteria for the AT&T batteries was not meaningful. Therefore, a technical meeting was held on February 1, 1994 between the NRC staff and the

licensee to resolve the staff's concerns regarding the changes to TS sections 4.8.2.1.2.e and 4.8.2.1.2.f.

Subsequently, by letter dated February 10, 1994, the licensee agreed to modify TS 4.8.2.1.2.e to show that battery capacity for the AT&T batteries is at least 95% of the manufacturer's rating when subjected to a performance discharge test every 60 months. In addition, the licensee modified TS 4.8.2.1.2.f to show that the batteries have degraded when battery capacity drops more than 5% of capacity based on the previous performance test, or is below 100% of the manufacturer's rating in 4.8.2.1.2.f.

Additionally, the licensee has proposed a modified performance discharge test to replace the performance discharge test in 4.8.2.1.2.e. A modified discharge test is a test of the battery capacity and its ability to provide a high rate, short duration load (usually the highest rate of the duty cycle) and will confirm the battery's ability to meet the critical period of the load duty cycle.

The staff finds these changes acceptable.

2. Design Duty Cycle

The licensee has proposed to change the phrase "240 minutes" in Specification 4.8.2.1.2.d to "the design duty cycle." Also, the Bases would be changed to add a discussion of the design duty cycle and include a reference to UFSAR Subsection 8.3.2.1.1. The parameters of the design duty cycle, including overall duration, are controlled through the UFSAR update process, as described in 10 CFR 50.71(e), and by 10 CFR 50.59. These changes are in accordance with the Standard Technical Specifications for Westinghouse plants (NUREG-0452 and NUREG-1431).

3. Crosstie Breaker Limitations

The licensee has proposed to change the Limiting Condition for Operation (LCO) statement for Specification 3.8.2.1 to add the phrase "and with one of its associated crosstie breakers in the open position." This clarifying change provides a more direct relationship between the LCO and the Action statements. The staff finds this acceptable.

In addition, the licensee has proposed to reword and reformat the Action statements of Specification 3.8.2.1 to incorporate the crosstie loading limitation previously addressed in Specification 4.8.2.1.3. With both units operating, one of the two redundant 125 VDC buses may energize the opposite unit's corresponding 125 VDC bus when its charger is inoperable without a load restriction. Also, with one unit operating, the 125 VDC bus that is required to be operable may energize the shutdown unit's corresponding 125 VDC bus with its battery inoperable, provided the shutdown unit's bus load is restricted as required by the Action

statement. Since these are equivalent to the previous requirements, the staff finds this change acceptable.

The licensee has proposed changes to the Limiting Condition for Operation (LCO) statement for Specification 3.8.2.2 to add the phrase "and with one of its associated crosstie breakers in the open position." This clarifying change provides a more direct relationship between the LCO and the Action statements and is, therefore, acceptable.

The licensee proposed rewording and reformatting the Action statement in Specification 3.8.2.2 by incorporating the "*" provision of the LCO and the crosstie loading limitation previously addressed in Specification 4.8.2.1.3. This change will allow cross-tying the 125 VDC buses of two shutdown units under the conditions specified in the Action statements in addition to crosstie conditions previously allowed. Since the DC bus load requirements for a shutdown unit are substantially less than that for an operating unit, loading conditions involving two shutdown units are less severe than crosstie conditions involving an operating unit. The staff finds this acceptable.

4. Crosstie Loading Limitations

Because of the larger capacity of the AT&T battery, the licensee proposed a change to 3.8.2.1 Action statement to increase the crosstie loading limit to 100 amps for the AT&T battery, while retaining the 63 amp crosstie loading limit for the Gould battery. The crosstie loading requirement for the Gould battery is retained to allow for the transition period needed to install the AT&T batteries. The licensee added a discussion of the purpose for the crosstie loading limitations in the Bases section. These changes are acceptable.

5. Additional Changes

The licensee proposed a change to the battery allowable cell voltage from 2.05 to 2.07 volts for the Gould battery in the Bases Section. This change is consistent with the Standard Technical Specification for Westinghouse plants (NUREG-0452 and NUREG-1431) and is therefore acceptable.

The licensee proposed changes to TS section 3/4.8.2 as a result of replacing the existing 125 VDC Gould batteries with the new AT&T batteries. The staff has reviewed the licensee's submittal and has concluded that Byron and Braidwood plants can be operated safely with the new AT&T batteries and there is reasonable assurance that adequate DC power will be available to mitigate any credible event that can occur during and after the replacement of batteries. In addition, the licensee has resolved NRC staff concerns regarding the adequacy of the electrical equipment and cables, the design margin of the AT&T batteries, and the proposed modified performance discharge test in TS section 4.8.2.1.2.e. Therefore, the staff finds the proposed changes acceptable.

3.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Illinois State official was notified of the proposed issuance of the amendments. The State official had no comments.

4.0 ENVIRONMENTAL CONSIDERATION

The amendments change a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The NRC staff has determined that the amendments involve no significant increase in the amounts, and no significant change in the types, of any 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 (59 FR 4936). 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.

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Date: March 4, 1994