August 18, 1998

Mr. Oliver D. Kingsley, President
Nuclear Generation Group
Commonwealth Edison Company
Executive Towers West III
1400 Opus Place, Suite 500
Downers Grove, IL 60515

SUBJECT: ISSUANCE OF AMENDMENTS (TAC NOS. MA0769 AND MA0770)

Dear Mr. Kingsley:

The U.S. Nuclear Regulatory Commission (Commission) has issued the enclosed Amendment No. 94 to Facility Operating License No. NPF-72 and Amendment No. 94 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 January 14, 1998.

The amendments revise the Technical Specifications to support replacement of the 125 volt direct current (Vdc) AT&T batteries with new Charter Power Systems, Inc. (C&D) batteries. In addition, the crosstie loading limitation is revised to reflect the larger capacity of the C&D batteries.

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,

ORIG. SIGNED BY
Stewart N. Bailey, Project Manager
Project Directorate III-2
Division of Reactor Projects - III/IV
Office of Nuclear Reactor Regulation

Docket Nos. STN 50-456, STN 50-457

Enclosures: 1. Amendment No. 94 to NPF-72
2. Amendment No. 94 to NPF-77
3. Safety Evaluation

cc w/encls: see next page

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

August 18, 1998

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cc w/encls: see next page

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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. 94
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 January 14, 1998, 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:

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(2) Technical Specifications

The Technical Specifications contained in Appendix A as revised through Amendment No. 94 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 and shall be implemented within 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION

Stewart N. Bailey, Project Manager
Project Directorate III-2
Division of Reactor Projects - III/IV
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: August 18, 1998

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. 94
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 January 14, 1998, 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-77 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A as revised through Amendment No. 94 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 and shall be implemented within 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION

Stewart N. Bailey, Project Manager
Project Directorate III-2
Division of Reactor Projects - III/IV
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: August 18, 1998

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	C & D	200 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.

SURVEILLANCE REQUIREMENTS (Continued)

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) 127.6 volts (C & D) 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 (C & D only: 400×10^{-6} ohm, typical) and 2) the bi-level rack connector (both AT&T and C & D: 50×10^{-6} ohm, typical); from the measured cell-to-cell connection resistance.

SURVEILLANCE REQUIREMENTS (Continued)

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

f. At least once per 12 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% (C & D) of rated capacity from its capacity on the previous performance test or modified performance test, or is below 100% (AT&T) 90% (C & D) of the manufacturer's rating.

* Testing at a 2 year interval is acceptable as long as the battery capacity is greater than 100% of rated capacity and the battery shows no signs of degradation.

TABLE 4.8-2 (C & D)

BATTERY SURVEILLANCE REQUIREMENTS

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[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.
(5) Or battery charging current is less than 3 amps when on charge.
(6) Corrected for average electrolyte temperature.

D.C. SOURCES

SHUTDOWN

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	C & D	200 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 IEEE Std 450-1995, "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 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 (C & D) 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 (C & D) 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 (C & D), ensures the battery's capability to perform its design function.

ATTACHMENT TO LICENSE AMENDMENT NOS. 94 AND 94

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 8-12a	3/4 8-12a
3/4 8-13	3/4 8-13
B 3/4 8-2	B 3/4 8-2

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 94 TO FACILITY OPERATING LICENSE NO. NPF-72

AND AMENDMENT NO. 94 TO FACILITY OPERATING LICENSE NO. NPF-77

COMMONWEALTH EDISON COMPANY

BRAIDWOOD STATION, UNIT NOS. 1 AND 2

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

1.0 INTRODUCTION

Commonwealth Edison Company (ComEd, the licensee), by letter dated January 14, 1998, proposed to amend Appendix A, Technical Specifications (TS) of Facility Operating License Nos. NPF-72 and NPF-77 for Braidwood Station, Units 1 and 2 (Braidwood). The proposed amendments to TS Section 3/4.8.2, "Electrical Power Systems, D.C. Sources," and its Bases support replacement of the 125 volt direct current (Vdc) AT&T batteries with new Charter Power Systems, Inc. (C&D) batteries. In addition, the crosstie loading limitation is revised to reflect the increased capacity of the C&D batteries. Finally, all references to the previously installed Gould batteries are removed.

2.0 EVALUATION

The batteries currently installed at Braidwood are the AT&T round cell, high specific gravity type that have exhibited a loss of capacity when discharged and then recharged. ComEd plans to replace the AT&T round cell batteries on Unit 1 with new 125 Vdc C&D batteries during the upcoming refueling outage. ComEd proposed changes to the Braidwood TSs to reflect the installation of C&D batteries and to remove all reference to the previously installed Gould batteries.

The staff reviewed and evaluated the proposed TS changes as follows:

(1) All references to Gould batteries were removed from TS 3.8.2.1, Action c(1); TS 3.8.2.2, Action b(1); Surveillance Requirement (SR) 4.8.2.1.2.a, 4.8.2.1.2.e, 4.8.2.1.2.f; in a footnote to SR 4.8.2.1.2.b(2) and SR 4.8.2.1.2.c(3); Table 4.8-2; and the TS Bases for Section 4.8. Since the Gould batteries have all been replaced, these changes are acceptable.

(2) SR 4.8.2.1.2.a.2 adds the total battery terminal float voltage of ≥127.6 volts for the C&D batteries. This is the minimum vendor-recommended value for the total battery float charge (voltage range of 2.20 to 2.25 volts per cell with 58 cells). This ensures the effectiveness of the battery charger to float charge the batteries and is acceptable.

(3) In order to comply with IEEE Standard 450-1995, "Recommended Practice for Maintenance, Testing and Replacement of Vented Lead-Acid Batteries for Stationary

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Applications," ComEd proposed to revise SR 4.8.2.1.2.f to allow a performance test or a modified performance test. SR 4.8.2.1.2.f also identifies accelerated testing requirements, at least once per 12 months instead of 18 months, for a battery that is near its end of its service life or that shows signs of degradation. This SR has a note to clarify that as long as the battery capacity is greater than 100% of the rated capacity and the battery shows no signs of degradation, the testing interval is 2 years. The changes to SR 4.8.2.1.2.f reflect the current IEEE Standard 450-1995 for testing lead acid flooded batteries, and is acceptable. The clause, "and the battery shows no signs of degradation," was not proposed by ComEd, but was added by the NRC staff to make the footnote consistent with IEEE Standard 450-1995. This clause was agreed to by ComEd.

(4) Table 4.8.2, "Battery Surveillance Requirements," Notation (4) is revised to clarify that the electrolyte specific gravity is corrected for temperature only (and not level). This is consistent with the battery manufacturer's recommendations and with IEEE Standard 450-1995 (both IEEE 450 and C&D's operating instructions do not recommend correcting electrolyte specific gravity values for level, but for temperature only) and is acceptable.

(5) Table 4.8.2 Notation (5) is revised to change the charging current from 2 amps to 3 amps to reflect the larger capacity of the C&D battery. This change is acceptable.

(6) TS 3.8.2.1, Action c(1) and TS 3.8.2.2, Action b(1) were revised to add a crosstie loading limit (a load restriction while the battery is crosstied to opposite unit) for the C&D batteries. The limit of 200 amps for the C&D batteries ensures that the operable battery has the capacity to energize the design basis load of its associated DC bus while maintaining the limited DC loads of the crosstied, inoperable DC bus on the shutdown unit. The crosstie loading limit of 200 amps reflects the larger capacity of the C&D batteries and is acceptable.

CONCLUSION

The C&D batteries are similar in design to the previously installed Gould batteries except that they have a larger capacity. The C&D batteries have a larger capacity than the currently installed AT&T batteries, are qualified for a 20-year life, will provide the same functions and be operated with the same types of operational controls as those of the installed AT&T batteries. The crosstie limit is increased to take advantage of the larger C&D battery capacity. Based on the above, the staff finds the proposed TSs 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 and change SRs. 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 (63 FR 27758). 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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