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. MA4122, MA4123, MA4169 AND MA4170)

Dear Mr. Kingsley:

The U.S. Nuclear Regulatory Commission (Commission) has issued the enclosed Amendment No. ¹⁰⁸ to Facility Operating License No. NPF-37 and Amendment No. ₁₀₈ to Facility Operating License No. NPF-66 for the Byron Station, Unit Nos. 1 and 2, respectively, and Amendment No.¹⁰¹ to Facility Operating License No. NPF-72 and Amendment No. 101 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 October 30, 1998.

The amendments revise the Technical Specification (TS) requirements for spent fuel pool inadvertent draindown elevation.

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

Stewart N. Bailey, Project Manager, Section 2 Project Directorate III **Division of Licensing Project Management** Office of Nuclear Reactor Regulation

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Enclosures: 1. Amendment No. 108 2. Amendment No. 108 3. Amendment No. 101 4. Amendment No. 101 5. Safety Evaluation	to NPF-37 to NPF-66 to NPF-72 to NPF-77	CNorsworthy J. Hickman OGC, O15B18 G. Hill (8), T5C3 W. Beckper, O13H15	CThomas/TMendiola S. Bailey ACRS, T2E26 M. Jordan, RIII	
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*see previous page for concurrence

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O. Kingsley Commonwealth Edison Company

CC:

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U.S. Nuclear Regulatory Commission Braidwood Resident Inspectors Office RR 1, Box 79 Braceville, Illinois 60407

r

Mr. Ron Stephens Illinois Emergency Services and Disaster Agency 110 E. Adams Street Springfield, Illinois 62706

Chairman Will County Board of Supervisors Will County Board Courthouse Joliet, Illinois 60434

Commonwealth Edison Company Braidwood Station Manager RR 1, Box 84 Braceville, Illinois 60407-9619 O. Kingsley Commonwealth Edison Company

- 2 -

Byron/Braidwood Stations

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Ms. Pamela B. Stroebel Senior Vice President and General Counsel Commonwealth Edison Company P.O. Box 767 Chicago, Illinois 60690-0767

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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. 108 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 October 30, 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-37 is hereby amended to read as follows:



The Technical Specifications contained in Appendix A as revised through Amendment No. 108 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

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Anthony Mendiola, Chief, Section 2

Anthony Mendiola, Chief, Section 2 Project Directorate III Division of Licensing Project Management Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical Specifications

Date of Issuance: May 3, 1999



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. 108 License No. NPF-66

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- 1. The Nuclear Regulatory Commission (the Commission) has found that
 - Α. The application for amendment by Commonwealth Edison Company (the licensee) dated October 30, 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;
 - Β. 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:

The Technical Specifications contained in Appendix A (NUREG-1113), as revised through Amendment No. 108 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 and shall be implemented within 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION

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Anthony Mendiola, Chief, Section 2 Project Directorate III Division of Licensing Project Management Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical Specifications

Date of Issuance: May 3, 1999

ATTACHMENT TO LICENSE AMENDMENT NOS. 108 AND 108

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 page identified below and inserting the attached page. The revised page is identified by the captioned amendment number and contains marginal lines indicating the area of change.

Remove Pages

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4.0-2

4.0-2

DESIGN FEATURES (continued)

- 4.3 Fuel Storage
 - 4.3.1 <u>Criticality</u>

The spent fuel storage racks are designed and shall be maintained with:

- a. Fuel assemblies having a maximum U-235 enrichment of 5.0 weight percent;
- b. $k_{eff} < 1.0$ if fully flooded with unborated water which includes an allowance for uncertainties as described in WCAP-14416-NP-A, "Westinghouse Spent Fuel Rack Criticality Analysis Methodology";
- c. k_{eff} ≤ 0.95 if fully flooded with water borated to 550 ppm, which includes an allowance for uncertainties as described in WCAP-14416-NP-A, "Westinghouse Spent Fuel Rack Criticality Analysis Methodology";
- d. A nominal 10.32 inch north-south and 10.42 inch east-west center to center distance between fuel assemblies placed in Region 1 racks; and
- e. A nominal 9.03 inch center to center distance between fuel assemblies placed in Region 2 racks.

4.3.2 <u>Drainage</u>

The spent fuel pool is designed and shall be maintained to prevent inadvertent draining of the pool below elevation 410 ft, 0 inches.

4.3.3 <u>Capacity</u>

The spent fuel pool is designed and shall be maintained with a storage capacity limited to no more than 2870 fuel assemblies.

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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. 101 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 October 30, 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:

The Technical Specifications contained in Appendix A as revised through Amendment No. 101 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

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Anthony Mendiola, Chief, Section 2 Project Directorate III Division of Licensing Project Management Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical Specifications

Date of Issuance: May 3, 1999

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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. 101 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 October 30, 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:

The Technical Specifications contained in Appendix A as revised through Amendment No. 101 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

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Anthony Mendiola, Chief, Section 2 Project Directorate III Division of Licensing Project Management Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical Specifications

Date of Issuance: May 3, 1999

ATTACHMENT TO LICENSE AMENDMENT NOS. 101 AND 101

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

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

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

Remove Pages

Insert Pages

4.0-2

4.0-2

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4.3 Fuel Storage

4.3.1 <u>Criticality</u>

The spent fuel storage racks are designed and shall be maintained with:

- a. Fuel assemblies having a maximum U-235 enrichment of 5.0 weight percent;
- b. $k_{eff} < 1.0$ if fully flooded with unborated water which includes an allowance for uncertainties as described in WCAP-14416-NP-A, "Westinghouse Spent Fuel Rack Criticality Analysis Methodology";
- c. $k_{eff} \le 0.95$ if fully flooded with water borated to 550 ppm, which includes an allowance for uncertainties as described in WCAP-14416-NP-A, "Westinghouse Spent Fuel Rack Criticality Analysis Methodology";
- d. A nominal 10.32 inch north-south and 10.42 inch east-west center to center distance between fuel assemblies placed in Region 1 racks; and
- e. A nominal 9.03 inch center to center distance between fuel assemblies placed in Region 2 racks.

4.3.2 Drainage

The spent fuel pool is designed and shall be maintained to prevent inadvertent draining of the pool below elevation 410 ft, 0 inches.

4.3.3 <u>Capacity</u>

The spent fuel pool is designed and shall be maintained with a storage capacity limited to no more than 2870 fuel assemblies.



WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 108 TO FACILITY OPERATING LICENSE NO. NPF-37,

AMENDMENT NO. 108 TO FACILITY OPERATING LICENSE NO. NPF-66,

AMENDMENT NO. 101 TO FACILITY OPERATING LICENSE NO. NPF-72,

AND AMENDMENT NO. 101 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

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1.0 INTRODUCTION

By letter dated October 30, 1998, the Commonwealth Edison Company (ComEd, or the licensee) submitted a request to amend the licenses for Byron Station, Units 1 and 2, and Braidwood Station, Units 1 and 2. The amendments would revise the Technical Specification (TS) requirements related to the design of the Spent Fuel Pool (SFP). TS 4.3.2, "Fuel Storage, Drainage," specifies that the SFP is designed and shall be maintained to prevent inadvertent draining of the pool below elevation 423 feet, 0 inches for Braidwood and 423 feet, 2 inches for Byron. According to the licensee, the values of 423 feet, 0 inches for Braidwood and 423 feet 2 inches for Byron were based on the elevation of the siphon breaks in the SFP cooling system return lines. These TS values did not consider all of the possible failure modes of the SFP cooling system or the SFP surface skimmer system. ComEd proposes to change the TS inadvertent draindown elevation to 410 feet, 0 inches for both stations. This elevation bounds the potential draindown events that could be caused by maloperation or failures of the SFP cooling system and the SFP surface skimmer system at both stations.

2.0 EVALUATION

The Byron and Braidwood (B/B) spent fuel pools were designed to the guidance provided by Revision 1 of Regulatory Guide (RG) 1.13, as is described in the B/B Updated Final Safety Analysis Report (UFSAR). RG 1.13 provides acceptable methods for implementing General Design Criterion 61, "Fuel Storage and Handling Criteria for Nuclear Power Plants," of Appendix A of 10 CFR 50, including the requirement for the prevention of inadvertent draining of the pool to an unacceptably low water level. Additional guidance for draindown protection is provided by the Standard Review Plan (NUREG-0800), Section 9.1.3, "Spent Fuel Pool Cooling and Cleanup System," which states the systems are acceptable if they have been designed such that in the event of failure of inlets, outlets, piping, or drains, the pool level will not be inadvertently drained below a point approximately 10 feet above the top of the active fuel.

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At Braidwood and Byron, the SFP is shared between units 1 and 2. The SFP cooling and cleanup system consists of two cooling loops and one surface-skimmer loop. To prevent a piping failure in the cooling or skimmer loops from gravity draining the SFP below the water level required for adequate radiation shielding, the loops are designed such that the piping connections are near the normal water level or they are provided with anti-siphon protection. The cooling loop suction connections are approximately 6½ feet below the normal water level so that a break in these lines can not gravity drain the SFP below that level. The cooling loop return lines contain an anti-siphon hole approximately 1 foot below the normal water level to prevent gravity siphoning of the SFP via these lines. The suction side of the skimmer loop uses a surface extractor that floats on the water surface. At Byron the surface extractor is limited in travel to approximately 9 feet below the normal water level (which is still approximately 16½ feet above the top of the fuel), while at Braidwood the skimmer loop suction piping contains an anti-siphon hole approximately 2. The skimmer loop discharge connections are approximately 5 to 6 feet below the normal water level.

The staff previously reviewed and approved the design of Byror, and Braidwood spent fuel pools. The Byron Safety Evaluation Report (SER), NUREG-0876, states "all connections to the spent-fuel pool are either near the normal water level or are provided with antisiphon holes to preclude possible draining of the pool water," and concludes the design is acceptable. The Braidwood SER, NUREG-1002, states this conclusion is also applicable to Braidwood. The clicensee's proposal does not involve a change to the configuration or operation of the Spent Fuel Pool.

To determine whether the proposed TS value for minimum SFP inadvertent drain down level meets the Standard Review Plan (SRP) and regulatory guide acceptance criteria, the staff evaluated scenarios where failure of the SFP cooling or skimmer loop initiated gravity siphoning of the SFP coolant. Based on the piping configuration at the Byron and Braidwood Stations, the minimum potential level in the SFP that results from an inadvertent drain down event was determined to be 415' 1/4" at Byron Station, and 417' 9 3/8" at Braidwood Station. With the maximum nominal top of stored active fuel located at elevation 398' 8", uncovering of the stored fuel is prevented and suitable shielding is maintained.

The staff also reviewed the B/B UFSAR fuel handling accident in the SFP and the SFP dewatering incident evaluations to ensure they were not affected by the proposed change. TS LCO 3.7.14 prohibits fuel movement at B/B with less than 23 feet of coolant above the stored fuel. Therefore, any dewatering effects from system failures would be detected and addressed by the required Actions ensuring that the fuel handling analyses remain unaffected. Likewise, the initial conditions for the dewatering accident analysis are not affected by this proposed TS change because they are not assumed to be coincident with the additional dewatering effects of postulated SFP cooling or skimmer loop failures. Therefore, the current dewatering incident shielding analysis and resultant water levels over the spent fuel at B/B remain valid.

The staff has reviewed the proposed change to the B/B TSs for SFP inadvertent drain elevation and has determined that the proposed level continues to meet the guidance in RG 1.13 and SRP 9.1.3 and is, therefore, 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 (63 FR 69335). 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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Principal Contributor: Stewart N. Bailey

Date: May 3, 1999