

October 6, 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. MA0765, MA0766, MA0767 AND MA0768)

Dear Mr. Kingsley:

The U.S. Nuclear Regulatory Commission (Commission) has issued the enclosed Amendment No. 104 to Facility Operating License No. NPF-37 and Amendment No. 104 to Facility Operating License No. NPF-66 for the Byron Station, Unit Nos. 1 and 2, respectively, and Amendment No. 96 to Facility Operating License No. NPF-72 and Amendment No. 96 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 December 30, 1997.

The amendments change the Technical Specifications for the condensate storage tank (CST) level and the automatic auxiliary feedwater pump switchover from the suction of the CST to the essential service water system.

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 50-454, STN 50-455,
STN 50-456 and STN 50-457

- Enclosures: 1. Amendment No. 104 to NPF-37
- 2. Amendment No. 104 to NPF-66
- 3. Amendment No. 96 to NPF-72
- 4. Amendment No. 96 to NPF-77
- 5. Safety Evaluation

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JHickman	WBeckner, O-13H15
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cc w/encl: See next page

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NAME	SBAILEY:SUB		CMOORE		JHICKMAN		GHUBBARD	*	R Weisman		SRICHARDS	SA
DATE	09/30/98		09/2/98		09/30/98		09/ /98		09/24/98		09/ /98	

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* by memo dated 8/11/98

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

October 6, 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. MA0765, MA0766, MA0767 AND MA0768)

Dear Mr. Kingsley:

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The amendments change the Technical Specifications for the condensate storage tank (CST) level and the automatic auxiliary feedwater pump switchover from the suction of the CST to the essential service water system.

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,

A handwritten signature in black ink, appearing to read "Stewart N. Bailey".

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

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

Enclosures: 1. Amendment No. 104 to NPF-37
2. Amendment No. 104 to NPF-66
3. Amendment No. 96 to NPF-72
4. Amendment No. 96 to NPF-77
5. Safety Evaluation

cc w/encl: See next page

O. Kingsley
Commonwealth Edison Company

cc:

Ms. C. Sue Hauser, Project Manager
Westinghouse Electric Corporation
Energy Systems Business Unit
Post Office Box 355
Pittsburgh, Pennsylvania 15230

Joseph Gallo
Gallo & Ross
1250 Eye St., N.W., Suite 302
Washington, DC 20005

Michael I. Miller, Esquire
Sidley and Austin
One First National Plaza
Chicago, Illinois 60603

Howard A. Learner
Environmental law and Policy
Center of the Midwest
35 East Wacker Dr., Suite 1300
Chicago, Illinois 60601

U.S. Nuclear Regulatory Commission
Byron Resident Inspectors Office
4448 N. German Church Road
Byron, Illinois 61010-9750

Regional Administrator, Region III
U.S. Nuclear Regulatory Commission
801 Warrenville Road
Lisle, Illinois 60532-4351

Ms. Lorraine Creek
RR 1, Box 182
Manteno, Illinois 60950

Chairman, Ogle County Board
Post Office Box 357
Oregon, Illinois 61061

Mrs. Phillip B. Johnson
1907 Stratford Lane
Rockford, Illinois 61107

Byron/Braidwood Stations

George L. Edgar
Morgan, Lewis and Bochius
1800 M Street, N.W.
Washington, DC 20036

Attorney General
500 S. Second Street
Springfield, Illinois 62701

Illinois Department of Nuclear Safety
Office of Nuclear Facility Safety
1035 Outer Park Drive
Springfield, Illinois 62704

Commonwealth Edison Company
Byron Station Manager
4450 N. German Church Road
Byron, Illinois 61010-9794

Commonwealth Edison Company
Site Vice President - Byron
4450 N. German Church Road
Byron, Illinois 61010-9794

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

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

O. Kingsley
Commonwealth Edison Company

- 2 -

Byron/Braidwood Stations

Ms. Bridget Little Rorem
Appleseed Coordinator
117 N. Linden Street
Essex, Illinois 60935

Document Control Desk-Licensing
Commonwealth Edison Company
1400 Opus Place, Suite 400
Downers Grove, Illinois 60515

Commonwealth Edison Company
Site Vice President - Braidwood
RR 1, Box 84
Braceville, IL 60407

Mr. David Helwig
Senior Vice President
Commonwealth Edison Company
Executive Towers West III
1400 Opus Place, Suite 900
Downers Grove, IL 60515

Mr. Gene H. Stanley
PWR's Vice President
Commonwealth Edison Company
Executive Towers West III
1400 Opus Place, Suite 900
Downers Grove, IL 60515

Mr. Steve Perry
BWR's Vice President
Commonwealth Edison Company
Executive Towers West III
1400 Opus Place, Suite 900
Downers Grove, IL 60515

Mr. Dennis Farrar
Regulatory Services Manager
Commonwealth Edison Company
Executive Towers West III
1400 Opus Place, Suite 500
Downers Grove, IL 60515

Ms. Irene Johnson, Licensing Director
Nuclear Regulatory Services
Commonwealth Edison Company
Executive Towers West III
1400 Opus Place, Suite 500
Downers Grove, IL 60515

Commonwealth Edison Company
Reg. Assurance Supervisor - Braidwood
RR 1, Box 79
Braceville, Illinois 60407

Commonwealth Edison Company
Reg. Assurance Supervisor - Byron
4450 N. German Church Road
Byron, Illinois 61010-9794

Mr. Michael J. Wallace
Senior Vice President
Commonwealth Edison Company
Executive Towers West III
1400 Opus Place, Suite 900
Downers Grove, IL 60515



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. 104
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 December 30, 1997, 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:

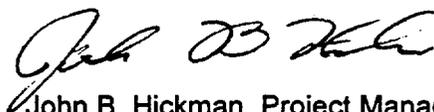
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P PDR

(2) Technical Specifications

The Technical Specifications contained in Appendix A as revised through Amendment No. 104 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



John B. Hickman, 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: October 6, 1998



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. 104
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 December 30, 1997, 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-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. 104 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



John B. Hickman, 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: October 6, 1998

ATTACHMENT TO LICENSE AMENDMENT NOS. 104 AND 104

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

3/4 3-27
3/4 7-6
B 3/4 7-2

Insert Pages

3/4 3-27
3/4 7-6
B 3/4 7-2

TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

<u>FUNCTIONAL UNIT</u>	<u>TRIP SETPOINT</u>	<u>ALLOWABLE VALUE</u>
6. Auxiliary Feedwater (Continued)		
f. Division 11 for Unit 1 (Division 21 for Unit 2) ESF Bus Undervoltage- Start Motor-Driven Pump	2870 volts	2730 volts
g. Auxiliary Feedwater Pump Suction Pressure- Low (Transfer to Essential Service Water)	≥ 18.1 psia	≥ 17.4 psia
7. Automatic Opening of Containment Sump Suction Isolation Valves		
a. Automatic Actuation Logic and Actuation Relays	N.A.	N.A.
b. RWST Level-Low-Low Coincident with Safety Injection	See Item 1. above for Safety Injection Trip Setpoints and Allowable Values.	

PLANT SYSTEMS

CONDENSATE STORAGE TANK

LIMITING CONDITION FOR OPERATION

3.7.1.3 The condensate storage tank (CST) shall be OPERABLE with a contained water level of at least 60%* (75%**).

APPLICABILITY: MODES 1, 2, and 3.

ACTION:

With the CST inoperable, within 4 hours either:

- a. Restore the CST to OPERABLE status or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours, or
- b. Demonstrate the OPERABILITY of the Essential Service Water System as a backup supply to the auxiliary feedwater pumps and restore the CST to OPERABLE status within 7 days or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.

SURVEILLANCE REQUIREMENTS

4.7.1.3.1 The CST shall be demonstrated OPERABLE at least once per 12 hours by verifying the contained water level is within its limits when the tank is the supply source for the auxiliary feedwater pumps.

4.7.1.3.2 The Essential Service Water System shall be demonstrated OPERABLE at least once per 12 hours by performing the surveillance specified in Specification 4.7.4a. whenever the Essential Service Water System is the supply source for the auxiliary feedwater pumps.

*Applicable to Unit 1 and to Unit 2 after Cycle 7.

**Not applicable to Unit 1. Applicable to Unit 2 through Cycle 7.

3/4.7 PLANT SYSTEMS

BASES

3/4.7.1.1 SAFETY VALVES (Continued)

- h_{fg} = Heat of vaporization for steam at the highest MSSV opening pressure including tolerance and accumulation, as appropriate, in BTU/lbm.
- N = Number of loops in the plant (=4).

The values calculated from this algorithm were adjusted lower for use in Technical Specification 3.7.1.1 to account for instrument and channel uncertainties (9% power).

3/4.7.1.2 AUXILIARY FEEDWATER SYSTEM

The OPERABILITY of the Auxiliary Feedwater System ensures that the Reactor Coolant System can be cooled down to less than 350°F from normal operating conditions in the event of a total loss-of-offsite power.

The motor-driven auxiliary feedwater pump is capable of delivering a total feedwater flow of 740 gpm at a pressure of 1450 psig to the entrance of the steam generators. The diesel-driven auxiliary feedwater pump is capable of delivering a total feedwater flow of 740 gpm at a pressure of 1450 psig to the entrance of the steam generators. This capacity is sufficient to ensure that adequate feedwater flow is available to remove decay heat and reduce the Reactor Coolant System temperature to less than 350°F when the RHR System may be placed into operation.

3/4.7.1.3 CONDENSATE STORAGE TANK

The minimum water level required for OPERABILITY in the condensate storage tank (CST) provides 200,000 gallons of useable water to the suction of the auxiliary feedwater (AF) system. This amount ensures that sufficient water is available to: (1) maintain the reactor coolant system at HOT STANDBY conditions for 9 hours with steam discharge to the atmosphere concurrent with a total loss-of-offsite power, and (2) maintain a unit in HOT STANDBY for 2 hours following a reactor trip, followed by a cooldown to 350°F in 4 hours, at which time the residual heat removal system can be put into service.

Additionally, the minimum CST requirement provides a high probability that switchover to the essential service water (SX) supply will not occur as long as the CST water supply remains available. This design feature helps maintain the long term reliability and availability of the steam generators by supplying higher quality condensate water to the steam generators except for circumstances where the safety-related SX water supply is required due to the unavailability of the CST. The minimum CST level includes an allowance for water that may not be usable because of tank discharge line location, dynamic head loss considerations, fluid vortexing in the tank, AF pump startup suction pressure considerations, and instrument uncertainties for the CST level and the AF suction switchover instruments.

3/4.7.1.4 SPECIFIC ACTIVITY

The limitations on Secondary Coolant System specific activity ensure that the resultant offsite radiation dose will be limited to a small fraction of 10 CFR Part 100 dose guideline values in the event of a steam line break. This dose also includes the effects of a coincident 1 gpm reactor to secondary tube leak in the steam generator of the affected steam line. These values are consistent with the assumptions used in the safety analyses.



**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. 96
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 December 30, 1997, 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. 96 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: October 6, 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. 96
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 December 30, 1997, 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. 96 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 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: October 6, 1998

ATTACHMENT TO LICENSE AMENDMENT NOS. 96 AND 96

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

3/4 3-27
3/4 7-6
B 3/4 7-2

Insert Pages

3/4 3-27
3/4 7-6
B 3/4 7-2

TABLE 3.3-4 (Continued)
ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

<u>FUNCTIONAL UNIT</u>	<u>TRIP SETPOINT</u>	<u>ALLOWABLE VALUE</u>
6. Auxiliary Feedwater (Continued)		
f. Division 11 for Unit 1 (Division 21 for Unit 2) ESF Bus Undervoltage- Start Motor-Driven Pump	2870 volts	2730 volts
g. Auxiliary Feedwater Pump Suction Pressure- Low (Transfer to Essential Service Water)	≥ 18.1 psia	≥ 17.4 psia
7. Automatic Opening of Containment Sump Suction Isolation Valves		
a. Automatic Actuation Logic and Actuation Relays	N.A.	N.A.
b. RWST Level-Low-Low Coincident with Safety Injection	46.7%	44.7%
	See Item 1. above for Safety Injection Trip Setpoints and Allowable Values.	

PLANT SYSTEMS

CONDENSATE STORAGE TANK

LIMITING CONDITION FOR OPERATION

3.7.1.3 The condensate storage tank (CST) shall be OPERABLE with a contained water level of at least 57%* (66%**) {80%***}.

APPLICABILITY: MODES 1, 2, and 3.

ACTION:

With the CST inoperable, within 4 hours either:

- a. Restore the CST to OPERABLE status or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours, or
- b. Demonstrate the OPERABILITY of the Essential Service Water System as a backup supply to the auxiliary feedwater pumps and restore the CST to OPERABLE status within 7 days or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.

SURVEILLANCE REQUIREMENTS

4.7.1.3.1 The CST shall be demonstrated OPERABLE at least once per 12 hours by verifying the contained water level is within its limits when the tank is the supply source for the auxiliary feedwater pumps.

4.7.1.3.2 The Essential Service Water System shall be demonstrated OPERABLE at least once per 12 hours by performing the surveillance specified in Specification 4.7.4a. whenever the Essential Service Water System is the supply source for the auxiliary feedwater pumps.

*Applicable to Unit 1 after Cycle 8 and to Unit 2 after Cycle 8.

**Applicable to Unit 1 after Cycle 7. Applicable to Unit 2.

***Applicable to Unit 1 through Cycle 7. Not applicable to Unit 2.

3/4.7 PLANT SYSTEMS

BASES

3/4.7.1.1 SAFETY VALVES (Continued)

- h_{fg} = Heat of vaporization for steam at the highest MSSV opening pressure including tolerance and accumulation, as appropriate, in BTU/lbm.
- N = Number of loops in the plant (=4).

The values calculated from this algorithm were adjusted lower for use in Technical Specification 3.7.1.1 to account for instrument and channel uncertainties (9% power).

3/4.7.1.2 AUXILIARY FEEDWATER SYSTEM

The OPERABILITY of the Auxiliary Feedwater System ensures that the Reactor Coolant System can be cooled down to less than 350°F from normal operating conditions in the event of a total loss-of-offsite power.

The motor-driven auxiliary feedwater pump is capable of delivering a total feedwater flow of 740 gpm at a pressure of 1450 psig to the entrance of the steam generators. The diesel-driven auxiliary feedwater pump is capable of delivering a total feedwater flow of 740 gpm at a pressure of 1450 psig to the entrance of the steam generators. This capacity is sufficient to ensure that adequate feedwater flow is available to remove decay heat and reduce the Reactor Coolant System temperature to less than 350°F when the RHR System may be placed into operation.

3/4.7.1.3 CONDENSATE STORAGE TANK

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Additionally, the minimum CST requirement provides a high probability that switchover to the essential service water (SX) supply will not occur as long as the CST water supply remains available. This design feature helps maintain the long term reliability and availability of the steam generators by supplying higher quality condensate water to the steam generators except for circumstances where the safety-related SX water supply is required due to the unavailability of the CST. The minimum CST level includes an allowance for water that may not be usable because of tank discharge line location, dynamic head loss considerations, fluid vortexing in the tank, AF pump startup suction pressure considerations, and instrument uncertainties for the CST level and the AF suction switchover instruments.

3/4.7.1.4 SPECIFIC ACTIVITY

The limitations on Secondary Coolant System specific activity ensure that the resultant offsite radiation dose will be limited to a small fraction of 10 CFR Part 100 dose guideline values in the event of a steam line break. This dose also includes the effects of a coincident 1 gpm reactor to secondary tube leak in the steam generator of the affected steam line. These values are consistent with the assumptions used in the safety analyses.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 104 TO FACILITY OPERATING LICENSE NO. NPF-37,
AMENDMENT NO. 104 TO FACILITY OPERATING LICENSE NO. NPF-66,
AMENDMENT NO. 96 TO FACILITY OPERATING LICENSE NO. NPF-72,
AND AMENDMENT NO. 96 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 letter dated December 30, 1997, Commonwealth Edison Company (ComEd, or the licensee) proposed changes to the current Technical Specifications (TS) and the proposed improved Technical Specifications (ITS) for the Byron Station, Unit Nos. 1 and 2, and Braidwood Station, Unit Nos. 1 and 2. The proposed changes would revise TS 3.7.1.3 (ITS 3.7.6), "Condensate Storage Tank," and its associated bases to raise the minimum required condensate storage tank (CST) level. The licensee also proposed to revise the auxiliary feedwater (AFW) pump suction pressure-low trip setpoint in TS Table 3.3-4, "Engineered Safety Features Actuation System Instrumentation Trip Setpoints" (ITS Table 3.3.2-1, "Engineered Safety Features Actuation System Instrumentation"). The AFW pump low-pressure trip automatically transfers the AFW pumps' suction from the CST to the essential service water (SX) system. The proposed change is intended to ensure that the design basis requirements for the AFW system are accurately reflected in the TSs. The Byron and Braidwood units are currently operating with conservative administrative limits for minimum CST level.

The licensee proposed to increase the minimum required CST level from 40 percent to 75 percent for Byron, Units 1 and 2, from 40 percent to 80 percent for Braidwood, Unit 1, and from 40 percent to 66 percent for Braidwood, Unit 2. After a modification is installed on the AFW suction pressure instrumentation, a minimum required level of 60 percent will be required for Byron, Units 1 and 2, and a level of 57 percent will be required for Braidwood, Unit 2. The minimum required level of 57 percent will also apply to Braidwood, Unit 1, after the instrumentation modification is complete following additional modifications to increase the Unit 1 CST height.

Additionally, the licensee proposed to change the AFW pump low-pressure trip setpoint from 1.22 inches of Mercury vacuum (1.22" Hg) to ≥ 18.1 pounds per square inch absolute (psia) and change the allowable value from 2" Hg to ≥ 17.4 psia. The current 1.22" Hg and 2" Hg values are equivalent to 14.1 psia and 13.7 psia, respectively. Thus, the proposed change results in

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increases in the trip setpoint and corresponding allowable value. There is no upper limit for the setpoint since the safety-related source of AFW is the SX system and an earlier than required transfer is within the design basis.

2.0 BACKGROUND

The AFW system supplies cooling water to the steam generators upon loss of main feedwater supply. The AFW system employs a motor-driven (MD) pump and a diesel-driven (DD) pump. Normally, both the MDAFW pump and the DDAFW pump take suction from the CST. When the CST is unavailable, both pumps take suction from the SX system. Switchover from the CST to the SX system is designed to occur automatically on low pressure in the AFW pump suction line coupled with an auto-start of the AFW system.

In 1994, the licensee identified operability concerns involving the postulated failure of the nonsafety-related CST piping in the turbine building during a seismic event. The postulated failure of the nonseismic piping could possibly result in atmospheric pressure in the AFW pump suction line. With the previous setpoint of 1.22" Hg (14.1 psia) for the automatic switchover, a failure of the nonseismic piping could result in not reaching the switchover setpoint because the resultant atmospheric pressure (14.7 psia) was higher than the trip setpoint. As a result of this determination, the licensee administratively increased the minimum CST levels (for each unit) to 75 percent at Byron and 80 percent at Braidwood. The minimum administrative limit at Braidwood, Unit 2, was later changed to 66 percent after the physical height of the tank was raised. The AFW pump switchover trip setpoint was also raised from 14.1 to 18.1 psia and the low pressure alarm setpoint was raised from 16.1 to 20.1 psia. A low pressure AFW pump trip, designed to protect the pumps from loss of suction, was likewise raised from 12.5 psia to 16.5 psia.

3.0 EVALUATION

The operability of the CST with the current TS minimum water level of 40 percent is intended (TS design basis) to ensure that sufficient water (200,000 gallons) is available to maintain the reactor coolant system (RCS) at hot standby conditions for at least 9 hours with steam discharge to the atmosphere concurrent with total loss-of-offsite power.

In December 1997, the licensee performed a design calculation to determine the minimum required volume of water in the CST to meet the design and licensing basis requirements (200,000 gallons available to AFW). This calculation accounted for design issues including instrument uncertainty, replacement steam generators at Byron, Unit 1, and Braidwood, Unit 1, and factors affecting the volume of useable water in the CST. The calculation also involved determining the amount of water required to minimize the potential for an inadvertent switchover of the AFW pump suction from the CST to the SX system. The automatic switchover is designed to occur under emergency conditions if the CST becomes unavailable (e.g., due a seismic event or a tornado).

After the operability concern from 1994 was addressed, a modification was designed to the AFW suction pressure instrumentation to filter the pressure spike signal that occurs during the startup of a MDAFW pump. This modification will help reduce the potential for an inadvertent switchover of the AFW supply from the CST to the SX system. Therefore, the proposed TS minimum level also decreases from the original administrative limit after the modification is installed.

The proposed minimum CST level reflects a conservative value that bounds the TS basis requirements for the CST. The new analysis considered the licensing basis requirements for the AFW system along with the physical characteristics of the CSTs and associated piping. For example, the suction pressure transient and fluid vortexing in the CSTs following AFW pump actuation were taken into consideration and conservatively modeled in the analysis. In addition, conservative level instrumentation uncertainties were calculated, and finally, a reconstitution of the AFW requirements for cooldown and the impact of replacement steam generators were calculated. The proposed changes are intended to ensure that all of the design considerations have been addressed.

The proposed minimum CST level reflects a conservative value that bounds the TS basis requirements for the CST. The level also ensures that sufficient water is available in the CST to minimize the potential for an inadvertent switchover to the SX system under emergency conditions, unless that switchover is required due to the unavailability of the CSTs. The revised levels also ensure that all accident analysis assumptions are met.

Based on the conservatism in the licensee's analysis and the fact that the proposed changes in the required minimum volume are conservative in nature (i.e., higher than the existing minimum required level) the staff concludes that the proposed changes to TS 3.7.1.3 (ITS 3.7.6) are acceptable. The licensee's proposed Bases for these TSs have also been reviewed by the staff, and the staff concluded that they adequately reflect the design requirements for the CST inventory.

The proposed changes to TS Table 3.3-4 (ITS Table 3.3.2-1) are intended to reflect the current design values for the AFW suction transfer trip setpoint and the design basis of the AFW system. These proposed changes are also conservative in nature since they provide added assurance that the switchover to the SX system will occur in accordance with the design basis. Based on the conservative nature of the proposed changes which increase the switchover setpoint, the staff concludes that these changes are also acceptable.

4.0 SUMMARY

Based on its review, the staff concludes that the proposed changes are necessary in order for the TS requirements to be consistent with the design basis of the AFW system including General Design Criterion (GDC) 2, "Design Basis for Protection Against Natural Phenomena," and GDC 34, "Residual Heat Removal." The staff has further concluded that the changes are more conservative than the existing TS requirements and are consistent with the accident analysis of those events that assume a minimum volume of water in the CST. The proposed changes also provide added assurance that the automatic suction switchover will function as designed upon loss of the CST while minimizing the potential for inadvertent switchover. The staff has, therefore, concluded that the proposed changes are acceptable.

5.0 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.

6.0 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 9596). 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.

7.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendments will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: W. LeFave
C. Saadu

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