May 26, 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. MA0077, MA0078, MA0079 AND MA0080)

Dear Mr. Kingsley:

The U.S. Nuclear Regulatory Commission (Commission) has issued the enclosed Amendment No. 103 to Facility Operating License No. NPF-37 and Amendment No. 103 to Facility Operating License No. NPF-66 for the Byron Station, Unit Nos. 1 and 2, respectively, and Amendment No. 93 to Facility Operating License No. NPF-72 and Amendment No. 93 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 24, 1997.

The amendments revise the surveillance frequency for the turbine throttle valves and the turbine governor valves from monthly to quarterly.

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,

/s/

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. 103 to NPF-37
2. Amendment No. 103 to NPF-66
3. Amendment No. 93 to NPF-72
4. Amendment No. 93 to NPF-77
5. Safety Evaluation

DF01 1/1

cc w/encl: see next page

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DOCUMENT NAME: G:\CMNTSP\BRAID-BY\BB0077.AMD *see previous page for concurrence

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

May 26, 1998

Mr. Oliver D. Kingsley, President
Nuclear Generation Group
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1400 Opus Place, Suite 500
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SUBJECT: ISSUANCE OF AMENDMENTS (TAC NOS. MA0077, MA0078, MA0079 AND MA0080)

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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. 103 to NPF-37
2. Amendment No. 103 to NPF-66
3. Amendment No. 93 to NPF-72
4. Amendment No. 93 to NPF-77
5. Safety Evaluation

cc w/encl: see next page

O. Kingsley
Commonwealth Edison Company

cc:

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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. 103
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 24, 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.

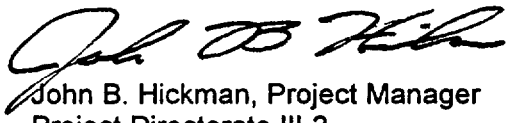
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. NPF-37 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A as revised through Amendment No. 103 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: May 26, 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. 103
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 24, 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. 103 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: May 26, 1998

ATTACHMENT TO LICENSE AMENDMENT NOS. 103 AND 103

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 3-65	3/4 3-65
B 3/4 3-6	B 3/4 3-6
B 3/4 3-7	B 3/4 3-7

INSTRUMENTATION

3/4.3.4 TURBINE OVERSPEED PROTECTION

LIMITING CONDITION FOR OPERATION

3.3.4 At least one Turbine Overspeed Protection System shall be OPERABLE.

APPLICABILITY: MODES 1, 2, AND 3.

ACTION:

a. With one throttle valve or one governor valve per high pressure turbine steam line inoperable and/or with one reheat stop valve or one reheat intercept valve per low pressure turbine steam line inoperable, restore the inoperable valve(s) to OPERABLE status within 72 hours, or close at least one valve in the affected steam line(s) or isolate the turbine from the steam supply within the next 6 hours.

b. With the above required Turbine Overspeed Protection System otherwise inoperable, within 6 hours isolate the turbine from the steam supply.

SURVEILLANCE REQUIREMENTS

4.3.4.1 The provisions of Specification 4.0.4 are not applicable.

4.3.4.2 The above required Turbine Overspeed Protection System shall be demonstrated OPERABLE:

a. During turbine operation at least once per 31 days by direct observation of the movement of the valves below through one complete cycle from the running position:

   1) Six turbine reheat stop valves, and
   2) Six turbine reheat intercept valves.

b. During turbine operation at least once per 92 days by direct observation of the movement of the valves below through one complete cycle from the running position:

   1) Four high pressure turbine throttle valves, and
   2) Four high pressure turbine governor valves.

c. Within 7 days prior to entering MODE 3 from MODE 4, by cycling each of the 12 extraction steam nonreturn check valves from the closed position,

d. During turbine operation at least once per 31 days by direct observation, of freedom of movement of each of the 12 extraction steam non-return check valve weight arms,

e. At least once per 18 months by performance of CHANNEL CALIBRATION on the Turbine Overspeed Protection Systems, and

f. At least once per 40 months by disassembling at least one of each of the valves given in Specifications 4.3.4.2a., b. and c. above, and performing a visual and surface inspection of valve seats, disks and stems and verifying no unacceptable flaws or corrosion.

3/4.3.3.8 LOOSE-PART DETECTION SYSTEM

The OPERABILITY of the loose-part detection system ensures that sufficient capability is available to detect loose metallic parts in the Reactor Coolant System and avoid or mitigate damage to Reactor Coolant System components. The allowable out-of-service times and Surveillance Requirements are consistent with the recommendations of Regulatory Guide 1.133, "Loose-Part Detection Program for the Primary System of Light-Water-Cooled Reactors," May 1981.

3/4.3.3.9 DELETED

3/4.3.3.10 EXPLOSIVE GAS MONITORING INSTRUMENTATION

The instrumentation includes provisions for monitoring the concentrations of potentially explosive gas mixtures in the WASTE GAS HOLDUP SYSTEM.

3/4 3.3.11 HIGH ENERGY LINE BREAK ISOLATION SENSORS

The OPERABILITY of the high energy line break isolation sensors ensures that the capability is available to promptly detect and initiate protective action in the event of a line break. This capability is required to prevent the potential for damage to safety-related systems and structures in the auxiliary building.

3/4.3.4 TURBINE OVERSPEED PROTECTION

This specification is provided to ensure that the turbine overspeed protection instrumentation and the turbine speed control valves are OPERABLE and will protect the turbine from excessive overspeed. Protection from turbine excessive overspeed is required since excessive overspeed of the turbine could generate potentially damaging missiles which could impact and damage safety-related components, equipment, or structures.

Specification 4.3.4.2a and b (High Pressure Turbine and Reheat Valves)

These valves isolate large quantities of steam with high potential for delivering energy to the rotor system. The turbine design recognizes this potential in providing rapid action, dual shut off capability in each path, remote testing capability, and a flow path that reduces the effects of changes in flow distribution, load reductions, and thermal transients during testing. The testing intervals are in accordance with the latest manufacturer's recommendations: "Operation and Maintenance Memo 093," Power Generation Business Unit, Westinghouse.

TURBINE OVERSPEED PROTECTION (continued)

Specification 4.3.4.2c and d (Extraction Steam Non-Return Check Valves)

These valves are provided to protect the turbine from reflux of steam remaining in the feedwater heater shells and piping following the pressure reduction caused by the actuation of valves in Specification 4.3.4.2a and b. The quantities of stored steam controlled by these valves are smaller and are divided up into separate heater shells. The feedwater heating system design, including these valves, did not intend routine full stroke testing.

The extraction steam check valves are self closing swing disk non-return valves which shut under the combined effect of gravity and reverse flow of steam. The weight of the disk is partly balanced by a counterweight and lever on the pivot shaft. A spring cylinder acting on the lever assists the start of the automatic closing, but is not intended to close the valve fully against normal steam flow and pressure. In normal operation the spring assist is held clear by air pressure acting on a piston under the spring. The turbine trip system releases the air pressure to assist the closing.

Manual stroking of the extraction steam non-return valves is possible under shutdown conditions by latching the turbine and applying the air pressure to the spring cylinder. It is possible to hear and feel the disk contact the seat solidly. This manual stroking was not provided for in the design but will be done within 7 days prior to entering Mode 3 from Mode 4.

The engineering specifications provided for testing the extraction steam non-return check valves during operation by equalizing the air pressure across the piston in the spring cylinder, permitting the spring to partially close the disk against the steam flow. The rotation of the shaft accompanying the disk closure can be observed by movement of the weight lever. The amount of movement observed in other stations has depended on the extraction steam conditions and valve size, but has been ample to indicate freedom of movement, and this will be verified during startup testing.

Partial stroking demonstrates that the disk system is free at the beginning of the closing stroke where the steam closing forces are smallest. As the disk enters a reverse steam flow the closing forces build up rapidly with progressive closure.

The design of the feedwater heating system is such that full stroke testing of the extraction steam non-return valves during turbine operation involves several penalties without significant additional advantages over partial stroke testing. The motor-operated isolating valve must be closed on an individual heater. Heater stages 1, 2, 3, and 4 are arranged in three parallel strings with cascaded drains in each string and heater stages 5, 6 and 7 are similarly arranged in two parallel strings. An entire string is taken out of service, isolated, and bypassed for maintenance. Isolating the extraction steam to a single intermediate heater involves several complications.

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. 93
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 24, 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. 93 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: May 26, 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. 93
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 24, 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. 93 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: May 26, 1998

ATTACHMENT TO LICENSE AMENDMENT NOS. 93 AND 93

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 3-65	3/4 3-65
B 3/4 3-6	B 3/4 3-6
B 3/4 3-7	B 3/4 3-7

3/4.3.4 TURBINE OVERSPEED PROTECTION

LIMITING CONDITION FOR OPERATION

3.3.4 At least one Turbine Overspeed Protection System shall be OPERABLE.

APPLICABILITY: MODES 1, 2, AND 3.

ACTION:

a. With one throttle valve or one governor valve per high pressure turbine steam line inoperable and/or with one reheat stop valve or one reheat intercept valve per low pressure turbine steam line inoperable, restore the inoperable valve(s) to OPERABLE status within 72 hours, or close at least one valve in the affected steam line(s) or isolate the turbine from the steam supply within the next 6 hours.

b. With the above required Turbine Overspeed Protection System otherwise inoperable, within 6 hours isolate the turbine from the steam supply.

SURVEILLANCE REQUIREMENTS

4.3.4.1 The provisions of Specification 4.0.4 are not applicable.

4.3.4.2 The above required Turbine Overspeed Protection System shall be demonstrated OPERABLE:

a. During turbine operation at least once per 31 days by direct observation of the movement of the valves below through one complete cycle from the running position:

   1. Six turbine reheat stop valves, and
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   1. Four high pressure turbine throttle valves, and
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c. Within 7 days prior to entering MODE 3 from MODE 4, by cycling each of the 12 extraction steam nonreturn check valves from the closed position,

d. During turbine operation at least once per 31 days by direct observation, of freedom of movement of each of the 12 extraction steam non-return check valve weight arms,

e. At least once per 18 months by performance of CHANNEL CALIBRATION on the Turbine Overspeed Protection Systems, and

f. At least once per 40 months by disassembling at least one of each of the valves given in Specifications 4.3.4.2a., b. and c. above, and performing a visual and surface inspection of valve seats, disks and stems and verifying no unacceptable flaws or corrosion.

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The OPERABILITY of the loose-part detection system ensures that sufficient capability is available to detect loose metallic parts in the Reactor Coolant System and avoid or mitigate damage to Reactor Coolant System components. The allowable out-of-service times and Surveillance Requirements are consistent with the recommendations of Regulatory Guide 1.133, "Loose-Part Detection Program for the Primary System of Light-Water-Cooled Reactors," May 1981.

3/4.3.3.9 DELETED

3/4.3.3.10 EXPLOSIVE GAS MONITORING INSTRUMENTATION

The instrumentation includes provisions for monitoring the concentrations of potentially explosive gas mixtures in the WASTE GAS HOLDUP SYSTEM.

3/4.3.3.11 HIGH ENERGY LINE BREAK ISOLATION SENSORS

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Specification 4.3.4.2a and b (High Pressure Turbine and Reheat Valves)

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TURBINE OVERSPEED PROTECTION (Continued)

Specification 4.3.4.2c and d (Extraction Steam Non-Return Check Valves)

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The engineering specifications provided for testing the extraction steam non-return check valves during operation by equalizing the air pressure across the piston in the spring cylinder, permitting the spring to partially close the disk against the steam flow. The rotation of the shaft accompanying the disk closure can be observed by movement of the weight lever. The amount of movement observed in other stations has depended on the extraction steam conditions and valve size, but has been ample to indicate freedom of movement, and this will be verified during startup testing.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 103 TO FACILITY OPERATING LICENSE NO. NPF-37,

AMENDMENT NO. 103 TO FACILITY OPERATING LICENSE NO. NPF-66,

AMENDMENT NO. 93 TO FACILITY OPERATING LICENSE NO. NPF-72,

AND AMENDMENT NO. 93 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 September 24, 1997, Commonwealth Edison Company (ComEd, the licensee) proposed changes to the Technical Specifications (TSs) for Byron Station, Units 1 and 2, and Braidwood Station, Units 1 and 2. The proposed changes revise surveillance requirements (SRs) related to the turbine overspeed protection system. On the basis of past operational experience, Westinghouse Electric Corporation's (Westinghouse) recommendations for inspection intervals, and the results of the Westinghouse evaluation proprietary report WCAP-14732 (nonproprietary version is WCAP-14733), dated June 1997, the licensee proposes to increase the surveillance test interval for the turbine governor valves and turbine throttle valves from "at least once per 31 days" to "at least once per 92 days." The disassembly and inspection intervals for these valves will continue to be in accordance with the current TS SRs.

2.0 BACKGROUND

Byron, Units 1 and 2, and Braidwood, Units 1 and 2, are each equipped with Westinghouse BB-296 turbine generators with steam chests. The Westinghouse turbines are conventional 1800-rpm, tandem-compound units consisting of one double-flow, high-pressure cylinder and three double-flow, low-pressure cylinders. The turbines are provided with two moisture separator reheaters located between the high-pressure and the low-pressure cylinders.

Each high-pressure steamline to the high-pressure cylinder contains a throttle valve and a governor valve. A reheat stop valve and an intercept valve are provided in the crossover piping between each moisture separator reheater and the low-pressure turbine cylinders. The function of these valves is to control and limit the turbine speed and, in case of a loss of load, stop steam supply to the turbine.

The turbine generator system is equipped with overspeed protection to minimize the probability of turbine missiles and meet the requirements of General Design Criterion (GDC) 4, "Environmental and Dynamic Effects Design Bases." To demonstrate the operability of the turbine overspeed protection system, TS 4.3.4.2.a currently requires that the four turbine throttle

valves, the four turbine governor valves, the six turbine reheat stop valves and the six turbine reheat intercept valves be tested every 31 days.

The licensee proposes that the throttle valves and the governor valves be demonstrated operable by testing the valves once every 92 days instead of once every 31 days. NUREG-1366, "Improvements to Technical Specifications Surveillance Requirements," dated December 1992, identified turbine throttle valve and governor valve testing as an example where plant safety could be improved by decreasing the frequency of testing. NUREG-1366 recommends that where the turbine manufacturer agrees, the turbine valve testing frequency should be changed to quarterly. The guidance for implementing the recommendations in NUREG-1366 is provided in Generic Letter (GL) 93-05, "Line-Item Technical Specifications Improvements to Reduce Surveillance Requirements for Testing During Power Operation." The reheat stop valves and the reheat intercept valves would continue to be tested every 31 days.

ComEd proposes to modify TS SR 4.3.4.2.a by deleting the turbine throttle valves and governor valves and re-numbering the remaining items. TS SR 4.3.4.2.b will be added to include the throttle and governor valve testing at the new frequency of 92 days, and to also require direct observation of the movement of the valves through one complete cycle from the running position. The remaining surveillance requirements in TS SR 4.3.4.2 will be re-designated c, d, e, and f. Other associated administrative changes will also be made. Finally, ComEd proposes to change the Bases to refer to the most recent Westinghouse guidance, "Operation and Maintenance Memo 093."

The licensee stated that, since plant modifications were completed on Braidwood in the October 1989 and spring 1990 refueling outages and on Byron in the fall 1988 and spring 1989 outages, the turbine governor and throttle valves have been tested monthly with no failures. In addition, operational experience has shown no failures of these valves to close in response to turbine trip demands.

To establish the effects of turbine valve testing frequency, Westinghouse performed an evaluation of the probability of generating turbine missiles as a direct function of reducing the testing frequency of the turbine governor valves and throttle valves. The results are discussed in Westinghouse report WCAP-14732, "Probabilistic Analysis of Reduction in Turbine Valve Test Frequency for Nuclear Plants with Westinghouse BB-296 Turbines with Steam Chests," dated June 1997.

The Westinghouse evaluation focusses on the probability of turbine missile ejection due to destructive overspeed (runaway speed in excess of approximately 180 percent). Destructive overspeed is assumed to occur when at least one governor valve and throttle valve in the same steam chest fail to close after a system separation (sudden and total loss of load on the generator, such as the load loss that is experienced if the generator output breakers opened while the plant is at full power). Design overspeed (approximately 120 percent of rated turbine speed) and intermediate overspeed (approximately 130 percent) were not explicitly calculated because previous evaluations have indicated that they were not major contributors to turbine missile ejection probability for BB-296 turbines (Westinghouse report WCAP-11525, "Probabilistic Evaluation of Reduction in Turbine Valve Test Frequency," 1987). The turbine missile ejection frequencies in WCAP-14732 were calculated following the same basic methodology as is described in WCAP-11525. In a supplemental safety evaluation dated November 2, 1989, issued to Westinghouse, the NRC staff accepted this methodology for use in the determination of the probability of turbine missile generation.

WCAP-14732 used BB-296 failure rates for turbine governor and throttle valves based on plant operating experience over a data collection period from 1990 through and including 1995. This time period provided failure rates based on current valve design and maintenance practices while retaining adequate time for rare events to occur. Westinghouse added an allowance to cover any model uncertainties and to account for the probability of missile ejection from design and intermediate overspeed events. The destructive overspeed model was constructed assuming that a loss of load or system separation occurred. The frequency of system separation was calculated to be 0.29 per year; however, a more conservative value of 0.4 per year was used in the analysis. The conditional probability of missile ejection (e.g., the probability of valve failures) was then multiplied by the frequency of system separation to obtain the probability of missile ejection per year from destructive overspeed. The probability of turbine missile ejection due to destructive overspeed was calculated for turbine valve test intervals of 1 week, 1 month, 3 months, 6 months, and 12 months.

3.0 EVALUATION

For determining maintenance and testing schedules for turbine control and overspeed protection systems, the NRC staff recommended that the annual probability of turbine missile ejection not exceed 1.0E-5 a year for unfavorably oriented turbines and 1.0E-4 for favorably oriented turbines. Byron and Braidwood turbines are unfavorably oriented. For all test intervals analyzed (i.e., 1 week, 1 month, 3 months, 6 months, and 12 months), the missile ejection frequency from destructive overspeed met the acceptance criteria of 1.0E-5 a year. However, since the governor and throttle valve failure rates are based on plant operating experience (primarily monthly testing), sufficient failure information for longer test intervals does not currently exist. Westinghouse supports quarterly testing until reasonable failure rate data can be accumulated. For quarterly testing, the total probability of turbine missile ejection from destructive overspeed was determined to be 8.8E-7 per year.

The staff found that safety could be improved, equipment degradation decreased, and an unnecessary burden on personnel eliminated by reducing the amount of testing that the TSs require during power operation. GL 93-05 provided guidance to implement these recommendations as line-item TS improvements. These line-item TS improvements are reported in NUREG-1366. The proposed changes to the TS are in accordance with the above guidance.

Section 5.13 of NUREG-1366 provides a comprehensive evaluation of Turbine Overspeed Protection System Testing and contains NRC recommendations for the frequency of testing of turbine valves. NUREG-1366 recommends that where the turbine manufacturer agrees, the turbine valves testing frequency should be changed to one test done quarterly (i.e., the surveillance interval could be extended to up to 3 months if such a change is supported by the turbine manufacturer's generic data and the licensee follows the manufacturer's methodology using plant-specific data to justify the new test frequency). Westinghouse report WCAP-14732 recommended that all plants with BB-296 nuclear turbines with steam chests, such as the turbines at Byron and Braidwood, change the surveillance frequency to quarterly.

Section 10.2 of the Standard Review Plan (SRP), NUREG-0800, provides guidance on evaluating the surveillance testing of steam valves. The purpose of the guidance is to ensure that the turbine overspeed protection system will perform in a manner that meets the requirements of GDC 4 of Appendix A to 10 CFR Part 50 with regard to the protection of structures, systems, and components important to safety from the effects of turbine missiles.

With quarterly testing of the turbine throttle valves and governor valves, the total probability of turbine missile ejection from destructive overspeed was determined to be 8.8E-7 per year. This is within the NRC guidance of 1.0E-5 per year for unfavorably oriented turbines.

4.0 SUMMARY

The proposed TS amendment to increase the surveillance test interval for the turbine governor and throttle valves from "at least once every 31 days" to "at least once every 92 days" was found to be within the boundary of the guidance provided in NUREG-1366. The amendment complies with the requirements of GDC 4 of Appendix A to 10 CFR Part 50 and the intent of the guidance of Section 10.2 of the SRP with regard to the protection of structures, systems, and components important to safety from the effects of turbine missiles. Since plant modifications were completed, the turbine governor and throttle valves have not failed to close in response to turbine trip demands or surveillance tests. Furthermore, the probability of turbine-generated missiles is within NRC limits. On the basis of the staff's evaluation of the licensee's amendment request, the proposed changes to the surveillance requirements for the turbine overspeed protection system 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 surveillance requirement. 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 (63FR11917). 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.

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