

Mr. Oliver D. Kingsley, President November 1, 2001
Exelon Nuclear
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: ISSUANCE OF AMENDMENTS FOR BYRON STATION, UNITS 1 AND 2, AND
 BRAIDWOOD STATION, UNITS 1 AND 2 - REQUEST FOR LICENSE
 AMENDMENT FOR TECHNICAL SPECIFICATION 3.7.2, "MAIN STEAM
 ISOLATION VALVES" (MSIVs) (TAC NOS. MB3075, MB3076, MB3088, AND
 MB3089)

Dear Mr. Kingsley:

The U.S. Nuclear Regulatory Commission (Commission) has issued the enclosed Amendment No. 124 to Facility Operating License No. NPF-37 and Amendment No. 124 to Facility Operating License No. NPF-66 for the Byron Station, Unit Nos. 1 and 2, respectively, and Amendment No. 119 to Facility Operating License No. NPF-72 and Amendment No. 119 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 1, 2001, as supplemented by your letters dated October 9, 2001, and October 18, 2001.

The amendments revise Byron and Braidwood technical specifications (TS) surveillance requirement (SR) 3.7.2.1 and SR 3.7.2.2 to add a note stating that these surveillances are not required to be met until the first startup after September 27, 2001. This change is applicable to Byron Station Units 1 and 2, and Braidwood Unit 2 only. This change is not applicable to Braidwood Station, Unit 1, due to the recent restart of the unit after the refueling outage.

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,
/RA/

Mahesh Chawla, Project Manager, Section 2
Project Directorate III
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

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

Enclosures: 1. Amendment No. 124 to NPF-37
 2. Amendment No. 124 to NPF-66
 3. Amendment No. 119 to NPF-72
 4. Amendment No. 119 to NPF-77
 5. Safety Evaluation

cc w/encls: See next page

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The amendments revise Byron and Braidwood technical specifications (TS) surveillance requirement (SR) 3.7.2.1 and SR 3.7.2.2 to add a note stating that these surveillances are not required to be met until the first startup after September 27, 2001. This change is applicable to Byron Station Units 1 and 2, and Braidwood Unit 2 only. This change is not applicable to Braidwood Station, Unit 1, due to the recent restart of the unit after the refueling outage.

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,
/RA/
 Mahesh Chawla, Project Manager, Section 2
 Project Directorate III
 Division of Licensing Project Management
 Office of Nuclear Reactor Regulation

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

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- Enclosures: 1. Amendment No. 124 to NPF-37
 2. Amendment No. 124 to NPF-66
 3. Amendment No. 119 to NPF-72
 4. Amendment No. 119 to NPF-77
 5. Safety Evaluation

*See previous concurrence

ADAMS Accession Number: ML012980264

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Byron/Braidwood Stations

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EXELON GENERATION COMPANY, LLC

DOCKET NO. STN 50-454

BYRON STATION, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 124
License No. NPF-37

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Exelon Generation Company, LLC (the licensee) dated October 1, 2001, as supplemented by their letters dated October 9, 2001, and October 18, 2001, 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. 124 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

/RA/

Anthony J. 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: November 1, 2001

EXELON GENERATION COMPANY, LLC

DOCKET NO. STN 50-455

BYRON STATION, UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 124
License No. NPF-66

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Exelon Generation Company, LLC (the licensee) dated October 1, 2001, as supplemented by their letters dated October 9, 2001, and October 18, 2001, 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. 124 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. 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

/RA/

Anthony J. 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: November 1, 2001

ATTACHMENT TO LICENSE AMENDMENT NOS. 124 AND 124

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

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

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

Remove Pages

3.7.2-2

Insert Pages

3.7.2-2

EXELON GENERATION COMPANY, LLC

DOCKET NO. STN 50-456

BRAIDWOOD STATION, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 119
License No. NPF-72

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Exelon Generation Company, LLC (the licensee) dated October 1, 2001, as supplemented by their letters dated October 9, 2001, and October 18, 2001, 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. 119 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

/RA/

Anthony J. 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: November 1, 2001

EXELON GENERATION COMPANY, LLC

DOCKET NO. STN 50-457

BRAIDWOOD STATION, UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 119
License No. NPF-77

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Exelon Generation Company, LLC (the licensee) dated October 1, 2001, as supplemented by their letters dated October 9, 2001, and October 18, 2001, 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. 119 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

/RA/

Anthony J. 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: November 1, 2001

ATTACHMENT TO LICENSE AMENDMENT NOS. 119 AND 119

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

3.7.2-2

Insert Pages

3.7.2-2

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 124 TO FACILITY OPERATING LICENSE NO. NPF-37,
AMENDMENT NO. 124 TO FACILITY OPERATING LICENSE NO. NPF-66,
AMENDMENT NO. 119 TO FACILITY OPERATING LICENSE NO. NPF-72,
AND AMENDMENT NO. 119 TO FACILITY OPERATING LICENSE NO. NPF-77

EXELON GENERATION COMPANY, LLC

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

On September 26, 2001, Exelon Generation Company, LLC (Exelon, the licensee), determined that during start-up following the last refueling outages at Byron Station, Units 1 and 2, and Braidwood Station, Unit 2, surveillance requirement (SR) 3.7.2.1 and SR 3.7.2.2 were performed in MODE 4, and not MODE 3 as required by technical specification (TS) 3.7.2. Therefore, SR 3.0.3 was entered due to a missed TS SR, allowing 24 hours to perform the surveillance. Because performing the surveillance would have required shutting down the 3 units, the licensee requested enforcement discretion from the Nuclear Regulatory Commission (NRC). Without enforcement discretion, on September 27, at 4:00 p.m. CDT (5:00 p.m. EDT), Byron Station, Units 1 and 2, and Braidwood Station, Unit 2, would have been required to be in Mode 3 within the next 7 hours.

On September 27, 2001, at 12:05 p.m. CDT (1:05 p.m. EDT), the NRC granted Notice of Enforcement Discretion (NOED) to allow operation of Byron Station, Units 1 and 2, and Braidwood Station, Unit 2, in non-compliance with SR 3.7.2.1 and SR 3.7.2.2. This did not affect Braidwood, Unit 1, since it was in refueling outage and the required surveillances would be performed before restart.

By letter dated October 1, as supplemented by their letter dated October 9, 2001, Exelon requested that NRC exercise discretion not to enforce compliance with the actions required in Byron Station, Units 1 and 2, and Braidwood Station, Unit 2, TS 3.7.2, "Main Steam Isolation Valves" (MSIV). The licensee has proposed changes to TS 3.7.2 for Byron Station, Units 1 and 2, and Braidwood Station, Units 1 and 2, to revise surveillance requirement (SR) 3.7.2.1 and SR 3.7.2.2, to add a note stating that these requirements not be met until the first startup after September 27, 2001. Although the TS change is requested for Braidwood Unit 1, due to common TS between the two units, this change only applies to Braidwood Unit 2. The NOED

letter to the licensee was issued by NRC on October 3, 2001, requiring issuance of this amendment on an exigent basis.

Based upon the initial review of the submittals, the NRC staff needed additional information relating to the MSIVs. The staff requested additional information to determine whether there would be risk increase due to a potential common mode failure (CMF) to close that could be undetectable under the present MSIV test conditions (i.e., Mode 4 and 5). The specific information requested was maintenance history, confirmation of valve reliability, and description of design changes to the MSIVs within the last few years. Additionally, the staff needed to determine whether the licensee had considered the industry operating experience of MSIV failures attributable to solenoid operated valve (SOV) problems, as noted in NRC Information Notice 88-43, Solenoid Valve Problems (June 23, 1988), in their risk assessment.

The staff also reviewed MSIV-related Maintenance Rule functional failures (MRFFs) as monitored under the licensee's Maintenance Rule program. The request was sent to the licensee (ADAMS Accession number ML01291072). The information was discussed between the licensee and the NRC staff during a telephone conversation held on October 17, 2001. This information was officially transmitted by the licensee in their letter dated October 18, 2001.

2.0 BACKGROUND

Byron Station, Units 1 and 2 (Byron), and Braidwood Station, Units 1 and 2 (Braidwood), Technical Specification (TS) 3.7.2, requires four MSIVs to be operable. Surveillance Requirement (SR) 3.7.2.1 verifies the closure time of each MSIV is ≤ 5 seconds with a frequency in accordance with the Inservice Testing Program. TS 3.7.2 requires that four MSIVs in the steam lines be operable. The MSIVs are considered operable when the isolation times are within limits, and they close on an isolation actuation signal. An MSIV closure time of 8 seconds is assumed in the accident and containment analyses. The Inservice Testing Programs for Byron and Braidwood were developed in accordance with the requirements of the 1989 Edition of the American Society of Mechanical Engineers (ASME) Code by implementation of the ASME/ANSI OMa-1988 Operations and Maintenance (OM) Standard, Part 10 (OM-10). TS 3.7.2 provides assurance that the MSIVs will perform their design safety function to mitigate the consequences of accidents that could result in offsite exposures comparable to the 10 CFR Part 100 limits or the NRC staff approved licensing basis.

Although the stroke-time test required by Section 4.2.1 of OM-10 places no restrictions on the plant conditions under which the MSIVs are to be stroked, MSIVs are not closure time tested at power. Nevertheless, the SR section of the Bases for SR 3.7.2.1 currently states, "This test is conducted in Mode 3 with the unit at operating temperature and pressure. This SR is modified by a Note that allows entry into and operation in Mode 3 prior to performing the SR. This allows a delay of testing until Mode 3, to establish conditions consistent with those under which the acceptance criterion was generated."

SR 3.7.2.1

This Surveillance is normally performed upon returning a unit to operation following a refueling outage. Based on the licensee's TS bases, this test is to be conducted in Mode 3 with the unit at operating temperature and pressure. This SR is modified by a Note that allows entry into and operation in Mode 3 prior to performing the SR. This allows a delay of testing until Mode 3, to establish conditions consistent with those under which the acceptance criterion was generated.

During the conversion to the Improved Technical Specifications (ITS), the TS Bases were enhanced to clarify the intent of these SRs. Previously, the TS included the statement that, "The provisions of Specification 4.0.4 are not applicable for entry into Mode 3." The purpose of this statement was to allow entry into the Mode of Applicability, i.e., Mode 3, to perform the SR. However, this statement did not necessarily preclude performing the SR prior to reaching Mode 3. The TS Bases were revised during the ITS conversion to specify that the SR is conducted in Mode 3 with the units at operating temperature and pressure. The Bases were enhanced to clarify that the purpose of performing the SR at operating temperature and pressure is to establish conditions consistent with those under which the acceptance criteria was generated. As stated in the ITS conversion documentation, this enhancement was merely intended to be a reformatting of existing requirements; no technical change was intended to be made. However, the clarification specifically states that the test is conducted in Mode 3 at operating temperature and pressure, which is a technical change.

The licensee's judgement that the clarification was administrative in nature was based on the understanding that taking exception to the provisions of Specification 4.0.4 allowed testing to be performed in Mode 3 under similar conditions as assumed in the safety analyses. Based on statements made by the licensee during a telephone conference call with the NRC on September 27, 2001, the licensee's surveillance procedures for stroke-time testing the MSIVs, both before and after the ITS conversion, permitted MSIV stroke-time testing in Mode 3, 4, or 5 (i.e., during startup following a refueling outage).

In Mode 4 and 5 the average reactor coolant temperature is required to be between 200 °F and 350 °F. This would correspond to a main steam line (MSL) pressure of between zero and approximately 135 psi. In Mode 3 the average reactor coolant temperature is required to be greater than or equal to 350 °F. This would correspond to a MSL pressure between approximately 135 and 1,000 psi. In Modes 3, 4, and 5 there is very little or no flow in the main steam lines. Increased MSL pressure results in increase stem rejection force required to close the MSIVs.

SR 3.7.2.2

This Surveillance is normally performed upon returning the unit to operation following a refueling outage. The 18-month Frequency for testing is based on the refueling cycle. Operating experience has shown that these components pass the Surveillance when performed at the 18-month Frequency. Therefore, this Frequency is acceptable from a reliability standpoint. This SR is modified by a Note that allows entry into and operation in Mode 3 prior to performing the SR. This allows a delay of testing until Mode 3, to establish conditions consistent with those under which the acceptance criterion was generated.

3.0 EVALUATION

The proposed change revises SR 3.7.2.1 and SR 3.7.2.2 to add a second note that states, "Not required to be met until the first startup after September 27, 2001." The licensee requested a NOED from SR 3.7.2.1 and 3.7.2.2 be approved in order to continue operation of Byron Station, Units 1 and 2, and Braidwood Station, Unit 2, to avoid cycling the units through a thermal transient. A shutdown could initiate unnecessary challenges, unexpected transients and place an unnecessary thermal cycle on the primary and secondary systems. Byron Station, Units 1 and 2, and Braidwood Station, Unit 2, are currently operating in Mode 1, "Power Operation."

The long term integrity of the reactor vessel and other components of the primary and secondary systems can be adversely affected by the number of thermal transients that the components are subjected to during their lifetime. As each additional thermal transient can affect this integrity, it is prudent to avoid such transients to assure that the health and safety of the public is preserved.

Each of the four main steam lines contains a MSIV to provide isolation of steam generators in the event of a high energy line break or a steam generator tube rupture (SGTR). MSIV closure terminates flow from unaffected steam generator (SG) and precludes the blowdown of more than one SG. Also it minimizes the consequences of a high-energy line break (HELB), inside and outside the containment and minimizes the radiological consequences following a SGTR. The MSIVs automatically close on low steam line pressure, high negative steam pressure rates, and high-high containment pressure.

In its submittal, the licensee stated that it would be prudent to remain at power and minimize the potential safety consequences from a shutdown thermal transient on the units. The licensee considered the risk associated with continued operation in this condition to be less than that associated with an immediate controlled shutdown of three operating reactors. A shutdown could initiate unnecessary challenges, unexpected transients, and place an unnecessary thermal cycle on the primary and secondary systems.

The effect of operating for a time frame without demonstrating the ability to isolate the MSIVs within the TS required time under limiting test conditions has been assessed by the licensee. This has been done by postulating that valve stroke time could be greater than previously measured. The likelihood and magnitude of such a postulated increase, and the margin available to accommodate it, have been evaluated and determined to be acceptable.

3.1 MSIV Isolation Function (SR 3.7.2.2)

The MSIV isolation function is assumed in the design basis accident analyses described in Chapter 15 of the Updated Final Safety Analysis Report (UFSAR). Specifically, Chapter 15 analyses assume the MSIV closure in the analyses of the main steam line break (MSLB), feedwater line break (FWLB), containment pressure response to the steam line break, and SGTR. The MSLB, FWLB, and containment analyses assumes a steam line isolation time of 8 seconds, which includes logic delay and valve closure time. For the SGTR event, it is assumed that operators manually isolate the affected SG within 11 minutes.

The MSIVs at Byron and Braidwood are large (30- to 32-inch) hydraulically-operated double-disc gate valves which are designed to close under high differential pressure and flow conditions. As the disc approaches the closed position under high differential pressure and flow conditions, the fluid load increases rapidly and the differential pressure load becomes the dominant term in the required stem thrust calculation (i.e., much greater than the stem rejection force which is a function of system pressure).¹ Therefore, the inservice stroke-time tests of the MSIVs are only meant to provide a gross indication of the valves' ability to function. It is not practicable to stroke-time test the MSIVs under design-basis condition. Moreover, stroke-time testing does not obtain data or information that allows evaluation of operating characteristics sufficient to assess the capability of the valve to function under design-basis conditions. Testing the MSIVs in Mode 4, as was done by the licensee prior to the last startup, provides a reasonable indication of the valve's ability to function.

The licensee conducted a search of the Byron and Braidwood Stations' plant event database for determination of any previous failure of MSIVs to close when their closure was required. Among the five events between 1986 and 2001 found to require closure of MSIVs, all resulted in full closure of the MSIVs. Two of these events occurred when the plant was at 0 power, one occurred at 6.5 percent power, and the other two occurred when the plant was operating at 100 percent power. As such, plant operating conditions appear to have no effect on the MSIV closure capability. In all of these events, full closure of the affected MSIVs occurred.

Concerning failure of MSIVs, the licensee performed a review of other documents such as Information Notice (IN) 94-44, IN 94-08, IN 85-84, and Operating Plant Experience (OPEX) review of MSIV failures. These documents involved air-operated valves (AOVs), a globe valve, or a check valve, none of which are similar to the Byron or Braidwood Stations' MSIV design. Based on all of the above data, it was concluded that the ability of the MSIVs to close within the required time at operating pressure and temperature is not adversely affected. Failure to close has not been postulated due to the successful past history of fast exercise tests performed at both sites.

An evaluation of the safety significance and potential consequences of the proposed course of action was performed, including the following qualitative risk assessment. As demonstrated above, sufficient justification exists to reasonably conclude that the MSIVs are fully capable of achieving the 5-second closure criteria at normal operating pressure and temperature. Performing the SR under less limiting test conditions will not affect the failure frequency assumed for the MSIVs. Therefore, since the failure frequency is unaffected, the results of the PRA are unaffected by this situation.

Therefore, there is a reasonable assurance, based on the past history, that even though the verification of the MSIV closure to the isolation position on an actual or simulated actuation signal was performed in MODE 4, rather than MODE 3 as required in SR 3.7.2.2, these MSIVs will close when demanded.

¹ Reference EPRI TR-106563-V1 "Application Guide for Motor-Operated Valves in Nuclear Power Plants, Volume 1, Revision 1: Gate and Globe Valves", September 1999.

In the licensee's correspondence to the NRC, dated October 18, 2001, it was noted that three MRFFs of MSIVs were observed at the Byron and Braidwood sites. The MRFFs were related to minimum or maximum accumulator pressures below operability limits, and did not appear to affect MSIV closure capability. These failures (two at Byron and one at Braidwood) were detectable through continuous equipment monitoring or during operator surveillance rounds and system engineering walkdowns. During the October 17, 2001, telephone conversation, the licensee stated that the MSIVs were currently in a Maintenance Rule a(2) status (i.e., subject to normal condition monitoring since the MSIVs are meeting the SSC performance criteria established under the Maintenance Rule Program). As such, the proposed TS change would not result in increasing the MSIV fault exposure time for these types of functional failures.

3.2 MSIV Closure Time (SR 3.7.2.1)

The actuator system for the MSIVs is designed to provide a rapid closure in the event of an emergency. Because of complete redundancy with independent Train "A" and Train "B" components, the actuator is capable of performing its fast closure function with either one of the two hydraulic systems. When both Train "A" and Train "B" actuator components are utilized, as is the case upon receipt of a low steam line pressure or Hi-Hi containment pressure signal, the valve is designed to close within 2-1/2 seconds. Assuming a single failure of one of the redundant trains, the valve is still capable of closing within 5 seconds.

The electrical design of the MSIV control circuit has independent and redundant Train "A" and Train "B" actuator components. Each train is powered from a separate electrical Engineered Safety Feature (ESF) division that is actuated by a separate and independent MSIV emergency closure signal.

The licensee cited the MSIVs original equipment manufacturer's (OEM) finding that, based on their testing performed during the production of these and similar MSIVs, the most significant impact on the MSIV stroke time is main steam flow. The OEM indicated that impact due to main steam line full pressure would add a few tenths of a second to the valve stroke time without line pressure. The OEM's basis for these statements was from testing that was performed during the production of these and similar MSIVs.

The licensee also conducted a review of the surveillance history for the MSIV stroke time testing at Byron and Braidwood Stations, which were generally performed in MODES 4 and 5, except for two instances where the valves were post-maintenance tested in MODE 2. A Byron MSIV tested in April 1999 showed a stroke time of 2.34 seconds in cold condition and 2.63 seconds in MODE 2 under operating pressure and temperature, and a Braidwood MSIV tested in May 1996 showed a stroke time of 3.3 seconds in cold condition and 3.1 seconds in MODE 2 under operating pressure and temperature. These stroke time comparisons support the OEM's estimate of a relatively small impact of steam pressure on the MSIV stroke time. For the time period between 1993 and 2001, the MSIVs had stroke times ranging from 1.1 to 3.2 seconds in Byron Station, and from 2.1 to 4.5 seconds in Braidwood Station. The most recent stroke time data for Byron Station, Units 1 and 2, and Braidwood Station, Unit 2, showed the MSIV stroke times ranged from 2.9 seconds to 3.0 seconds.

Therefore, there is a reasonable assurance that, with the addition of a few tenths of a second to account for the impact of the steam pressure on the stroke time, the TS requirement of MSIV closure time ≤ 5 seconds would be met if the tests were performed in MODE 3. The total main steam isolation time of 8 seconds assumed in the safety analysis would still have margin to account for the MSIV closure time and the logic delay or signal process time of much less than 2 seconds. Therefore, the staff concludes that the existing Chapter 15 analyses with the assumption of 8-second main steam line isolation time remain valid. For the SGTR event, the assumption of operator manual isolation of the affected SG within 11 minutes would not be affected by the relatively short MSIV closure time.

For the SGTR event, it is assumed that operators manually isolate the affected SG within 11 minutes. This includes closing the MSIV and isolating the auxiliary feedwater source to the affected SG. This SGTR analysis assumes the completion of the action and does not account for a specific closure rate for the MSIV. Based on past performance data and vendor information, the licensee has reasonable assurance that the MSIVs will close in response to the required operator action. Therefore, there is no impact to the SGTR analysis.

The steamline break analysis is limiting at end of cycle based on the most negative moderator temperature coefficient and 0 ppm reactor coolant system (RCS) boron concentration. As a result, during the majority of the period for which relief is being requested, additional margin in boron concentration will be available. One of the key parameters for this analysis is the moderator temperature coefficient. The measured to predicted difference for all three units have been less than 3 pcm/ $^{\circ}$ F. In addition, the typically measured value has been more positive than the limit by at least 3 pcm/ $^{\circ}$ F, which indicates that adequate conservatism exists in moderator temperature coefficient input assumptions for the steamline break analysis performed by the licensee.

At Byron, between 1998 and 1999, the licensee replaced a total of 64 SOVs (8 per MSIV actuator) to maintain valve reliability based on the SOV environmental qualification service life. Of these replaced SOVs, only one failure due to valve seat leakage occurred in 2001. At Braidwood, there was only one MSIV SOV failure in the past 4 years. During the October 17, 2001, teleconference, the licensee indicated that the root cause was attributed to an internal defect of a soldered connection as revealed through the vendor's examination of the failed component. The failure was an isolated case and did not appear to have any generic implications for the other SOVs. The licensee also indicated that the SOVs were periodically tested under the licensee's valve testing program and the test data showed that the SOVs had functioned in a satisfactory manner.

With respect to NRC IN 88-43, the SOVs used at Byron and Braidwood are of a different manufacturer than the SOVs noted in the subject IN. Also, the SOVs are normally de-energized and are energized for MSIV closure. Therefore, the MSIV SOVs are not subjected to elevated thermal effects that could accelerate degradation of internal materials. In the de-energized state, the SOV temperatures are near ambient room temperature when the Byron or Braidwood Units are in Mode 3 or Mode 4 operation. As such, testing the SOVs in Mode 3 versus Mode 4 would not change the likelihood of detecting an SOV failure. The licensee's submittal dated October 1, 2001, also indicated that the MSIV stroke times were acceptable both before and after the replacement of the SOVs. Furthermore, the MSIV's OEM assessed the effect on overall MSIV closure times in Mode 4 versus Mode 3 at full temperature and

pressure conditions. The OEM indicated that MSIV closure times could be slightly slower due to increased steam flow and pressure differential across the valve. Actual post-maintenance testing (i.e., after corrective maintenance), of the MSIVs while in Mode 2, showed that the MSIV stroke times have good correlation with the OEM's assessments.

4.0 SUMMARY

The staff has reviewed the information provided by the licensee, relative to stroke-time testing of the MSIVs in Mode 4 or 5 as opposed to Mode 3 as specified in the TS Bases, and concludes that the ability of the MSIVs to close within the required time at operating pressure and temperature has not been adversely affected. The staff acknowledges the licensee's commitment to revise the surveillance procedures for stroke-time testing of the MSIVs to ensure the MSIVs are tested in Mode 3 and agrees with the licensee that this change should not impact normal operation of the MSIVs.

Although the potential for common mode failure exists independent of the proposed license amendment, the current test methods and conditions should be adequate to detect such failures based on the nature of the SOV design and actual in-situ performance. Postponement of a Mode 3 MSIV surveillance test should not affect overall MSIV valve reliability or ability to detect a CMF.

The staff also reviewed the additional information supporting the licensee's qualitative assessment that the risk associated with continued power operation would be less than that associated with an immediate controlled shutdown to perform MSIV surveillance tests at Mode 3. Since the capability of MSIV closure times is not affected by the change in surveillance intervals, the staff agrees that the failure frequency assumed for MSIVs may not change significantly (i.e., by an order of magnitude increase). Therefore, it is expected that there would be no measurable risk increase associated with continued operation at power.

Although no quantitative shutdown probabilistic risk assessments (PRAs) have been performed for the Byron or Braidwood stations, other plants having shutdown PRAs have demonstrated a non-zero transition risk due to forced equipment challenges during controlled shutdown operations. Furthermore, a shutdown could initiate unnecessary challenges, unexpected transients, and place unnecessary thermal cyclic effects on the primary and secondary systems.

Based on the above evaluation, the staff concludes that MSIVs will continue to close within the five-second closure time specified in the TS, and the assumption of 8-second main steam isolation time in the existing safety analyses in the UFSAR, Chapter 15, remains acceptable. The proposed TS change, to delay MSIV surveillance tests at Mode 3 operation, would not pose undue risk. Therefore, the exigent TS amendment request to allow SR 3.7.2.1 and 3.7.2.2 to not be met until the first startup after September 27, 2001 is acceptable.

5.0 EXIGENT CIRCUMSTANCES

The Commission's regulations, 10 CFR 50.91, contain provisions for issuance of amendments when the usual 30-day public notice period cannot be met. One such provision concerns

exigencies. An exigency is a case where the staff and the licensee need to act promptly, but failure to act promptly does not necessarily involve a plant shutdown, derating, or delay in start-up. The exigent case usually represents an amendment involving a safety enhancement to the plant.

Under such circumstances, the Commission notifies the public in one of two ways: by issuing a Federal Register notice providing an opportunity for hearing and allowing at least two weeks for prior public comments, or by issuing a press release discussing the proposed changes, using the local media. In this case, the Commission used the first approach.

The licensee submitted the request for amendment on October 1, 2001. It was noticed in the Federal Register on October 23, 2001, (66 FR 53643), at which time the staff proposed a no significant hazards consideration determination. The licensee requested that NRC exercise discretion not to enforce compliance with the actions required in Byron Station, Units 1 and 2, and Braidwood Station, Unit 2, TS 3.7.2, MSIV. The licensee has proposed changes to TS 3.7.2 for Byron Station, Units 1 and 2, and Braidwood Station Units 1 and 2, to revise SR 3.7.2.1 and SR 3.7.2.2, to add a note stating that these requirements not be met until the first startup after September 27, 2001. The NOED letter to the licensee was issued by NRC on October 3, 2001, requiring issuance of this amendment on exigent an basis within 4 weeks, as per the guidance provided in section C.2.0 of NRC Inspection Manual, Part 9900 - Technical Guidance for NOED. Therefore, the NRC staff is issuing the amendment under exigent circumstances.

6.0 FINAL NO SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION

The Commission's regulations in 10 CFR 50.92 state that the Commission may make a final determination that a license amendment involves no significant hazards considerations if operation of the facility in accordance with the amendment would not: (1) involve a significant increase in the probability of consequences of an accident previously evaluated; or (2) create the possibility of a new or different kind of accident from any accident previously evaluated; or (3) involve a significant reduction in a margin of safety.

Operation of the facility in accordance with the proposed amendment will not involve a significant increase in the probability or consequences of an accident previously evaluated. MSIV closure is the initiator of the inadvertent MSIV closure event. Operation of the affected units with MSIVs tested in Mode 4 instead of Mode 3 will not affect the probability of an inadvertent MSIV closure event, since the only effect would be to potentially delay the closure of the MSIVs. The MSIVs' OEM was contacted regarding the effect of system conditions on MSIV stroke times. The OEM indicated that the most significant impact on stroke time is main steam flow and that impact due to MSL pressures alone resulted in little change to valve closure time. According to the OEM, a few tenths of a second is added to full design steam line pressure stroke test versus stroke tests as performed without line pressure.

The OEM's basis for these statements was from testing that was performed during the production of these and similar MSIVs. Any delay in closure time will mitigate the effects of the resulting pressure transient caused by the inadvertent closure of the MSIV. There are no modifications to the hardware associated with accomplishing the closure functions. Therefore, there is no increase in the probability of the inadvertent MSIV closure event. The safety

function of the MSIVs is to close in the event of a high energy line break or to be closed in the event of a steam generator tube rupture. These are mitigative actions and are not initiators to any other accident scenario previously analyzed in the updated final safety analysis report.

Based on past data related to closure time, and vendor information stating that the valve stroke time impact due to increase in steam line pressure is on the order of a few tenths of a second, there is reasonable assurance the valves will still function within the assumed analysis time, thereby maintaining the analyzed dose consequence for the steam line break and feedline break accident analyses. The MSIVs will still function as assumed for the steam generator tube rupture event, in that the valves will function in response to operator action. Therefore, no additional source term is added to the steam generator tube rupture analysis and the consequence resulting from that event are not increased.

Therefore, due to the limited effect that the deficient testing has on the valve stroke time and the appreciable margin between the required stroke time and the assumed isolation time in the limiting analyses, the probability of occurrence and consequences of any accident previously analyzed are not significantly increased.

The proposed action does not involve physical alteration of the units. No new equipment is being introduced, and installed equipment is not being operated in a new or different manner. There is no change being made to the parameters within which the units are operated. There are no setpoints at which protective or mitigative actions are initiated that are affected by this proposed action. This proposed action will not alter the manner in which equipment operation is initiated, nor will the function demands on credited equipment be changed. This change does not impact normal operation of the MSIVs. In addition, no alteration in the procedures, which ensure the units remain within analyzed limits, is proposed, and no change is being made to procedures relied upon to respond to an off-normal event. As such, no new failure modes are being introduced. The proposed action does not alter assumptions made in the safety analysis. Therefore, the proposed action does not create the possibility of a new or different kind of accident from any accident previously evaluated.

The proposed action does not involve a significant reduction in the margin of safety. The margin of safety is assured by the operation of the plant within the prescribed parameters and by the diverse and redundant protection afforded by the reactor protection system (RPS) and engineered safety feature actuation system (ESFAS). The identified testing deficiency does not affect the parameters within which the unit is maintained, and is not detrimental to the actuation of the RPS or ESFAS functions. Reasonable assurance is provided that the MSIVs will achieve full closure within the required time interval. As noted above, there is additional margin between the required isolation time and that assumed in the limiting accident analysis.

Therefore, the Commission determines that the amendment involves no significant hazards consideration.

7.0 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.

8.0 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 made a final finding that the amendments involve no significant hazards consideration. 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.

9.0 CONCLUSION

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

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Date: November 1, 2001