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United States Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555

Subject: Application for Amendment to Appendix, Technical Specifications, for Facility Operating Licenses:

Byron Nuclear Power Station, Units 1 and 2
Facility Operating Licenses NPF-37 and NPF-66
NRC Docket Nos. 50-454 and 50-455

Braidwood Nuclear Power Station, Units 1 and 2
Facility Operating Licenses NPF-72 and NPF-77
NRC Docket Nos. 50-456 and 50-457

Main Steam Safety Valves Technical Specification Change Request

Pursuant to Title 10, Code of Federal Regulations, Part 50, Section 90 (10 CFR 50.90), Commonwealth Edison Company (ComEd) proposes to amend Appendix A, Technical Specifications, for Facility Operating Licenses NPF-37, NPF-66, NPF-72, and NPF-77 for Byron Nuclear Power Station, Units 1 and 2 (Byron), and Braidwood Nuclear Power Station, Units 1 and 2 (Braidwood), respectively. ComEd proposes to revise Technical Specification Section 3/4.7.1, "Turbine Cycle Safety Valves" and the associated Bases. The proposed revisions include:

1. Revising Table 3.7-2 to increase the as-found main steam safety valve (MSSV) lift setpoint to +/-3%, provide an as-left setpoint tolerance of +/-1%, and change a table notation.

2. Revising Technical Specification (TS) 3.7.1.1, Action a., to require the unit to be in hot shutdown, rather than cold shutdown, for consistency with Revision 1 of NUREG 1431, "Standard Technical Specifications for Westinghouse Plants", and adding a new Action b. to clarify the shutdown requirements when there are more than 3 inoperable main steam line Code safety valves on any one steam generator.

3. Revising the maximum allowable power range neutron flux high trip setpoints in Table 3.7-1.

The proposed changes in this license amendment request have been reviewed and approved by both On-site and Off-site Review in accordance with ComEd procedures. A detailed description and a safety analysis of the proposed changes are presented in Attachment A. The proposed changes to Appendix A, Technical Specifications, are presented in Attachments B-1 and B-2 for Byron and Braidwood, respectfully, ComEd has reviewed this proposed license amendment request in accordance with 10 CFR 50.92(c) and has determined that no significant hazards condition exists. This evaluation is documented in Attachment C. An Environmental Assessment has been completed and is contained in Attachment D.

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ComEd is notifying the State of Illinois of our application for this license amendment request by transmitting a copy of this letter and its attachments to the designated State Official.

Furthermore, ComEd respectfully requests that the NRC Staff review and approve this license amendment in a timely fashion.

To the best of my knowledge and belief, the statements contained in this document are true and correct. In some respects these statements are not based on my personal knowledge, but on information furnished by other ComEd employees, contractor employees, and/or consultants. Such information has been reviewed in accordance with company practice, and I believe to be reliable.

Please address any comments or questions regarding this matter to Marcia Lesniak at (708)663-6484.

Sincerely,

K. L. Graesser

K. L. Graesser
Site Vice President

Signed before me
on this 30th day of April, 1996
by Tracey Flusk
Notary Public

"OFFICIAL SEAL"
Tracey Flusk
Notary Public State of Illinois
My Commission Expires 1-13-00

Attachment A: Description and Safety Analysis of the Proposed Changes

Attachment B-1: Proposed Changes to Appendix A, Technical Specifications, for the Byron Nuclear Power Station, Units 1 and 2

Attachment B-2: Proposed Changes to Appendix A, Technical Specifications for the Braidwood Nuclear Power Station, Units 1 and 2

Attachment C: Evaluation of Significant Hazards Considerations

Attachment D: Environmental Assessment

cc: H. J. Miller, Regional Administrator-RIII
G. F. Dick, Byron Project Manager-NRR
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ATTACHMENT A

DESCRIPTION AND SAFETY ANALYSIS OF THE PROPOSED CHANGES

Summary of the Proposed Changes

Commonwealth Edison (ComEd) proposes to revise Technical Specification 3/4.7.1, Turbine Cycle Safety Valves, and the associated Bases. The proposed revisions include:

1. Revising Technical Specification (TS) 3.7.1.1, Action a., to require the unit to be in hot shutdown, rather than cold shutdown, for consistency with NUREG 1431, "Standard Technical Specifications for Westinghouse Plants," and adding a new Action b. to clarify the shutdown requirements when there are more than 3 inoperable main steam line Code safety valves on any one steam generator.

2. Revising Technical Specification Surveillance Requirement 4.7.1.1 to clarify that Specification 4.0.4 does not apply for entry into Mode 3 for Byron and Braidwood, and, for Braidwood only, deleting the one-time requirements for Unit 1, Cycle 5 and Unit 2 after outage A2F27.

3. Revising the maximum allowable power range neutron flux high trip setpoints in Table 3.7-1.

4. Revising Table 3.7-2 to increase the as-found main steam safety valve (MSSV) lift setpoint tolerance to ±3%, provide an as-left setpoint tolerance of ±1%, and change a table notation.

5. Deleting the orifice size column from Table 3.7-2.

6. Revising the Bases for TS 3.7.1.1 to be consistent with the proposed changes to TS 3.7.1.1.

The marked up Technical Specification pages for each station indicating the proposed changes are provided in Attachment B. A detailed discussion of each change follows.

1. **Proposed Changes to Technical Specification 3.7.1.1**

Description and Bases of the Current Requirement

Technical Specification 3.7.1.1, Action a., allows operation with four reactor coolant loops and associated steam generators in operation and with one or more main steam line Code safety valves inoperable provided that, within 4 hours, either the inoperable

valve is restored to operable status or the power range neutron flux high trip setpoint is reduced per Table 3.7-1; otherwise, be in at least hot standby within the next 6 hours and in cold shutdown within the following 30 hours.

Startup and/or power operation is allowable with safety valves inoperable within the limitations of the action requirements of TS 3.7.1.1 since secondary coolant system steam flow and thermal power will be limited as a consequence of reducing the power range neutron flux channels reactor trip settings.

Description and Bases of the Requested Revision

ComEd proposes to revise Technical Specification 3.7.1.1, Action a., to delete the words "four reactor coolant loops and associated steam generators in operation and with." The final mode reduction requirements are changed to require the unit to be in hot shutdown within 6 hours of reaching hot standby, rather than cold shutdown within 30 hours of reaching hot standby. The action statement adds words to clarify that the action applies when there are up to 3 inoperable main steam line Code safety valves on any one steam generator.

ComEd proposes to revise the title to Table 3.7-1 to delete "during four loop operation." The Table of Contents is also revised to reflect the title change.

ComEd also proposes to add a new Action b. to clarify the shutdown requirements when there are more than 3 inoperable main steam line Code safety valves on any one steam generator. That is, there is no provision to restore the inoperable valves to operable within 4 hours before the 6 hour clock to hot standby begins. The current Action b. becomes Action c.

These changes are based on TS 3.7.1, Action b., of NUREG-1431.

Impact of the Changes

The proposed change to require the final mode to be hot shutdown rather than cold shutdown is consistent with the applicability section of the specification, which does not require the MSSVs to be operable in hot shutdown. There are no credible transients requiring the MSSVs in Modes 4 and 5. The steam generators are not normally used for heat removal in Modes 5 and 6, and thus cannot be overpressurized. NUREG-1431 does not include requirements for the MSSVs to be operable in these modes. The change will also eliminate the unnecessary transient that had been imposed on the unit by forcing entry into cold shutdown. Therefore, these proposed changes have no significant negative impact on any system or operating mode.

The text describing reactor coolant loops and steam generators is redundant. TS 3.4.1.1, "Reactor Coolant Loops and Coolant Circulation - Startup and Power Operation," and TS 3.4.1.2, "Reactor Coolant Loops and Coolant Circulation - Hot Standby," provide restrictions on the number of operating reactor coolant loops and

steam generators. Therefore, deleting this text is editorial. Similarly, it is not necessary to state that Table 3.7-1 applies during four loop operation.

The new Action b. provides clarification to the current Action a. and is consistent with the requirements in NUREG-1431.

2. **Proposed Change to Surveillance Requirement 4.7.1.1**

Description and Bases of the Current Requirement

Technical Specification Surveillance Requirement (TSSR) 4.7.1.1 states that there are no additional requirements other than those required by TS 4.0.5. In addition, TSSR 4.7.1.1 contains additional one-time requirements resulting from Amendments 49 and 51 for Braidwood Station. These requirements were added to TSSR 4.7.1.1 to address calculational errors discovered in a vendor calibration procedure for the MSSVs.

Specification 4.0.5 verifies the operability of the MSSVs by verifying each MSSV lift setpoint in accordance with the inservice testing program. Testing of the MSSVs conforms to the requirements of American National Standards Institute/American Society of Mechanical Engineers (ANSI/ASME) BPV-XI, ASME Boiler and Pressure Vessel Code, 1983, Summer Addenda. This program ensures the requirements of Specification 4.0.5 are satisfied.

Description and Bases of the Requested Revision

ComEd proposes to revise TSSR 4.7.1.1 to clarify that TS 4.0.4 does not apply for entry into Mode 3 for Byron and Braidwood. That is, entry into Mode 3 would be allowed prior to completing surveillance testing on the MSSVs. The proposed revision also deletes the one-time requirements for Braidwood Unit 1, Cycle 5 and Braidwood Unit 2 after outage A2F27 that were added by Amendments 49 and 51.

The current practice for testing the MSSVs is to enter Action a. for TS 3.7.1.1 while testing the valves, since the applicable codes require the plant to be at normal operating temperature and pressure (Mode 3), and TSSR 4.0.4 would require the testing to be completed prior to entering Mode 3. This places severe time restrictions on the valve testing, and often conflicts with other plant startup requirements.

The one-time requirements for Braidwood are no longer applicable, and are, therefore, deleted.

Impact of the Changes

Changing TSSR 4.7.1.1 to delete the one-time requirements imposed by previous Braidwood amendments and allow entry into Mode 3 for MSSV testing for Byron and Braidwood will permit testing of the MSSVs at normal operating pressures and temperatures in accordance with the applicable codes while allowing a reasonable

amount of time for completion of the surveillance. The proposed change will reduce potential startup conflicts and maintain MSSV operability. This change is consistent with NUREG-1431.

3. Proposed Changes to Maximum Allowable Power Range Neutron Flux High Setpoints

Description and Bases of the Current Requirement

TS 3.7.1.1 allows continued power operation with inoperable MSSVs provided that reactor power is maintained below the power range neutron flux high setpoint values in Table 3.7-1. Setpoints are provided based on the number of inoperable safety valves on any operating steam generator.

These setpoints were based on the assumption that the maximum allowable initial power level is a linear function of the available MSSV relief capacity, as expressed in the following equation:

$$SP = \frac{(X) - (Y)(V)}{X} \times (109)$$

Where:

SP = Reduced reactor trip setpoint in percent of rated thermal power,

V = Maximum number of inoperable safety valves per steam line,

109 = Power range neutron flux-high trip setpoint for four loop operation,

X = Total relieving capacity of all safety valves per steam line in pounds mass per hour (lbm/hr), and

Y = Maximum relieving capacity of any one safety valve in lbm/hr

Description and Bases of the Requested Revision

ComEd proposes to revise the power range neutron flux high setpoints in the event of MSSV(s) inoperability based on a revision to the method for calculating the setpoints that was provided in a Westinghouse Potential Issues letter to ComEd dated January 25, 1994 (CCE-93-261, CAE-93-239). The proposed changes are as follows:

Maximum Number of Inoperable Safety Valves on any Operating Steam Generator	Maximum allowable power range neutron flux high setpoint (percent of rated thermal power)	
	Current TS Value	Proposed Value
1	87	60
2	65	43
3	43	25

Impact of the Changes

Westinghouse has determined that the method used to calculate the current setpoints may not be valid under certain conditions. That method assumes a linear relationship between the maximum allowable initial power level and available MSSV relief capacity. In particular, a loss of load/turbine trip (LOL/TT) transient from a reduced power condition may result in overpressurization of the main steam system. With fully operational MSSVs, it can be demonstrated that overpressure protection is provided at all initial power levels. However, TS 3.7.1.1 allows operation with a reduced number of operable MSSVs at a reduced power level. In certain LOL/TT scenarios from low initial power levels with pressure control available, the reactor trip may be delayed until the low-low steam generator level is reached. By this time, using the allowed reactor power levels of the current setpoints in TS 3.7.1.1 with one or more safety valves inoperable, the secondary side pressure may exceed the acceptance criterion of 110% of design pressure. As a result, Westinghouse recommended that the maximum allowable power range neutron flux high trip setpoints of TS 3.7.1.1 Table 3.7-1 be lowered.

This proposed change is more conservative than the current TS requirements. There is no operational impact on Braidwood or Byron since both stations have already administratively incorporated these reduced power range neutron flux high trip setpoints as a result of the Westinghouse letter dated January 25, 1994.

4. Main Steam Safety Valve Setpoint Tolerance

Description and Bases of the Current Requirement

Limiting condition for operation (LCO) 3.7.1.1 requires all MSSVs associated with each steam generator to be operable with lift settings as specified in Table 3.7-2. Table 3.7-2, "Steam Line Safety Valves Per Loop," includes a lift setpoint tolerance of ±1%. Additionally, Table 3.7-2 has a note that allowed the main steam line Code safety valve lift settings to have a ±3% tolerance until May 9, 1994. After that date,

the lift settings were reset to ± 1%. This note was added as a one-time requirement in Amendment 49 for Braidwood Station and Amendment 61 for Byron Station to address calculational errors in a vendor MSSV calibration procedure.

Operability of the MSSVs ensures the secondary coolant system pressure will be limited to within 110% (1320 pounds per square inch absolute (psia)) of its design pressure of 1200 psia during the most severe anticipated system operational transient. The maximum relieving capacity is associated with a turbine trip from 102% rated thermal power coincident with an assumed loss of condenser heat sink. The specified valve lift settings and relieving capacities are in accordance with the requirements of Section III of the ASME Boiler and Pressure Vessel Code, 1971 Edition. The total relieving capacity for all valves on all of the steam lines is 17.958 x 10^6 lbm/hr, which is 119% of the total secondary steam flow of 15.135 x 10^6 lbm/hr at 100% rated thermal power. A minimum of two operable MSSVs per steam generator ensures that sufficient relieving capacity is available for the allowable thermal power restrictions in Table 3.7-1 during startup and/or power operation.

Description and Bases of the Requested Revision

ComEd proposes to revise Table 3.7-2 to allow MSSV as-found setpoints to be within ±3% of the lift settings. The obsolete note is deleted and replaced with a note that requires all tested valves to be set to ±1% tolerance. The new note maintains the current set tolerance requirement and removes the reference to the outdated provision.

The change is consistent with the latest Nuclear Regulatory Commission (NRC) approved code, ANSI/ASME OM-1-1981, "Requirements for Inservice Performance Testing of Nuclear Power Plant Pressure Relief Devices," 1981. ComEd has determined that, over an operating cycle, the setpoint of the MSSVs changes by more than 1% from the original set-pressure. As a result, the plant is placed in an action statement. Changing the as-found setpoint to ±3% of the lift settings precludes the need to enter the action statement.

Impact of the Changes

The effects of increasing the as-found lift setpoint tolerance on the MSSVs have been examined, and it has been determined that, with the exception of the LOL/TT, the current accident analyses as described in the Updated Final Safety Analysis Report (UFSAR) remain valid. Neither the mass and energy release to the containment following a postulated loss-of-coolant accident (LOCA), nor the analysis of containment response following a LOCA, credit the MSSV in mitigating the consequences of an accident. Therefore, changing the MSSV lift setpoint tolerances would have no impact on the containment integrity analysis. In addition, based on the conclusion of the transient analysis, the change to the MSSV tolerance will not affect the calculated steam line break mass and energy releases inside containment.

The LOL/TT event was analyzed in order to quantify the impact of the setpoint tolerance relaxation. The evaluation in Westinghouse letter CAE-91-209/CAE 91-219

shows that all applicable acceptance criteria for this event remain satisfied and the conclusion presented in the UFSAR remains valid.

No operating conditions or modes will be changed as a result of this analysis. No new failure modes have been determined to exist as a result of this new analysis. The MSSVs will continue to relieve any unlikely system overpressure during all applicable operating modes. Finally, the conditions requiring the one-time note have been corrected. Thus, this change has nc significant negative impact on any system, operating mode, or accident analysis.

5. Proposed Change to Delete the Orifice Size Column from Table 3.7-2

Description and Bases of the Current Requirement

Table 3.7-2 contains a column for orifice size and lists a value of 16 in^2 for each MSSV. MSSV orifice size is the primary component in determining valve capacity and is a design parameter of the valve. MSSV capacity is used in Chapter 15 of the UFSAR to analyze plant response in the event of an accident.

Description and Bases of the Requested Revision

ComEd proposes to delete the orifice size column from Table 3.7-2. This information is not used by the operators, and the operators have no control of MSSV orifice size. MSSV capacity is discussed in UFSAR Section 10.3, Main Steam Supply System, and in UFSAR Chapter 15, Accident Analyses. The information is not appropriate for inclusion in the Technical Specifications and is, therefore, deleted.

Impact of the Changes

The proposed change does not introduce any new equipment, equipment modifications, or any new or different modes of plant operation. This change will not affect the operational characteristics of any equipment or systems. The MSSVs are described in detail in the UFSAR and the information is not required in the Technical Specifications.

6. Proposed Change to Technical Specification Bases 3/4.7.1.1

Description and Bases of the Current Requirement

The Bases for TS 3/4.7.1.1 contains information on secondary system pressure limits and how operability of the MSSV maintains design pressure during transients. The applicable ASME Boiler and Pressure Vessel Code (1971 Edition) is also referenced when discussing MSSV design flow rates and setpoints. The bases also contains a discussion on thermal power limitations based on the total number of safety valves inoperable.

Description and Bases of the Requested Revision

ComEd proposes to add new information to the bases section. One addition states that the requirement to set the steam line safety valves to within ±1% of the appropriate setpoint is consistent with Section III of the ASME Boiler and Pressure Vessel Code. The change also states that the allowed operating tolerance of ±3% is supported by the Commonwealth Edison Company, Byron/Braidwood Unit 1& 2 Overpressure Protection Report.

The equation that provides the bases for the reactor trip setpoint reductions is replaced by the following equation:

$$High\Phi = \frac{100}{Q}\left(\frac{w_s h_{fg} N}{K}\right)$$

Where:

$High\Phi$ = Safety Analysis power range high neutron flux setpoint, in percent.

Q = Nominal NSSS power rating of the plant (including reactor coolant pump heat), in Megawatts thermal (MWt) (= 3427.6 Mwt).

K = Conversion factor = 947.82 (BTU/sec.)/MWt.

w_s = Minimum total steam flow rate capability of the operable MSSVs on any one steam generator at the highest MSSV opening pressure including tolerance and accumulation, as appropriate, in lbm/sec.

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).

These changes to the Bases are proposed to address and support the changes made in TS 3.7.1.1, and Tables 3.7-1 and 3.7-2.

Impact of the Changes

No component or system operating characteristics will be affected by these revisions. The proposed setpoints in Table 3.7-1 are more limiting than those currently allowed in Specification 3.7.1.1. Westinghouse determined that the current setpoints are non-conservative for some combinations of reduced MSSV availability and reactor power levels. By reducing the setpoints, the original design margins for safety will be met.

Increasing the as-found valve setpoint tolerance from ±1% to ±3% does not have a significant impact on any accident. The peak primary and secondary pressures remain below 110% of design at all times. The MSSVs are actuated after accident initiation to protect the secondary systems from overpressurization. Increasing the as-found setpoint tolerance will not result in any hardware modification to the MSSVs. Therefore, there is not an increase in the probability of the spurious opening of a MSSV. Sufficient margin exists between the normal steam system operating pressure and the valve setpoint with the increased tolerance to preclude an increase in the probability of inadvertently actuating the valves.

SCHEDULE REQUIREMENTS

There are no specific scheduling requirements associated with this Amendment request.