

March 14, 1996

U. S. Nuclear Regulatory Commission  
Attn: Document Control Desk  
Washington, D. C. 20555

Subject: Request to Use American Society of Mechanical Engineers (ASME) Code Case N-514 in the Determination of Low Temperature Overpressure Protection System (LTOPS) Setpoints  
Byron Station Units 1 and 2  
NRC Docket Nos. 50-454/455

- References:
1. "Exemption from Requirements of 10 CFR 50.60 - Braidwood Station, Unit 1, R. Assa (NRC) to D. L. Farrar (ComEd), dated July 13, 1995.
  2. "Acceptance for Referencing of Topical Report WCAP-14040, Revision 1, "Methodology Used to Develop Cold Overpressure Mitigating System Setpoints and RCS Heatup and Cooldown Limit Curves C. I. Grimes (NRC) to R. A. Newton, Westinghouse Owner's Group, dated October 16, 1995.
  3. NRC Generic Letter 96-03, "Relocation of the Pressure Temperature Limit Curves and Low Temperature Overpressure Protection System Limits," , dated January 31, 1996.

Commonwealth Edison (ComEd) requests an exemption, per 10 CFR 50.12, to use the American Society of Mechanical Engineers (ASME) Section XI, Code Case N-514, "Low Temperature Overpressure Protection Section XI, Division 1," in the determination of Low Temperature Overpressure Protection System (LTOPS) Setpoints for Byron Nuclear Station Units 1 and 2. 10 CFR 50.12(a) (2) (iii) allows for the Commission to consider granting an exemption under special circumstances; specifically, if compliance with current regulations would result in undue hardship to a licensee.

Code Case N-514 (Attachment 1) was approved by the ASME on February 12, 1992, and the guidance of this code case has been incorporated into the 1993 Addenda to the ASME Boiler and Pressure Vessel Code, Section XI, Appendix G. Code Case N-514 provides guidance on when LTOPS shall be in operation and the maximum pressure to which

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LTOPS shall limit Reactor Vessel pressure. In particular, Code Case N-514 states: "LTOP systems shall limit the maximum pressure in the vessel to 110% of the pressure determined to satisfy Appendix G paragraph G-2215 of Section XI, Division 1." In Attachments 2 and 3, ComEd requested approval to use Code Case N-514 in the development of LTOPS setpoints for Braidwood Units 1 and 2. The NRC granted approval of the exemption request in Reference 1.

Per the requirements of 10 CFR 50.12 (a) (2) (iii), compliance with the current requirements for determination of LTOPS setpoints included in 10 CFR 50 Appendix G will result in future hardship for Byron Station without a concurrent increase in the level of quality and safety. The hardship is that the operating window between the maximum allowed RCS pressure for LTOPS and the minimum RCS pressure required for Reactor Coolant Pump (RCP) operation is significantly restricted when physical conditions such as PORV overshoot, RCP pump  $\Delta$ Ps, and static head corrections are taken into account in the setpoint determination. In the future, maintaining the current restrictions will increase the likelihood of LTOPS actuation at lower setpoints. This has the potential to endanger the RCP seals.

As documented in the Braidwood request and subsequent clarification letter (Attachments 2 and 3), ComEd has reviewed ASME Code Case N-514 and determined that its use would provide an acceptable level of quality and safety. There are many conservatisms incorporated into the pressure-temperature (PT) limits calculated using the current methodology of ASME Code Section XI, Appendix G. ASME explicitly recognized the amount of margin inherent in the Appendix G PT limits by incorporating Code Case N-514 in the 1993 Addenda to ASME Code Section XI, Appendix G. Similar to the Braidwood circumstance, use of Code Case N-514 will not result in any design changes or plant modifications at Byron Station. LTOPS will still function to limit Reactor Pressure Vessel pressure and the use of Code Case N-514 will still ensure that the Reactor Pressure Vessel is protected from brittle fracture.

Byron and Braidwood Stations intend to submit a License Amendment Request in August, 1996, for review and approval of the Improved Technical Specifications (ITS), which includes the relocation of the pressure temperature (P/T) limit curves and the low temperature overpressure protection (LTOP) system setpoints to a pressure temperature limits report (PTLR). The request to implement the PTLR will be consistent with the recommendations contained in Generic Letter (GL) 96-03 (Reference 2). Also documented in GL 96-03, the NRC indicated that licensees must request an exemption from Appendix G for ASME Code Case N-514 until the NRC completes the rulemaking process for revisions to 10 CFR 50.55a and 10 CFR Part 50, Appendix G.

March 14, 1996

Work is currently ongoing for Byron and Braidwood Stations to generate revised Reactor Coolant System (RCS) heatup and cooldown curves and LTOPS setpoints using the methodology documented in Westinghouse Owner's Group WCAP-14040-NP-A, Rev. 2. WCAP-14040 was reviewed and approved by the NRC (Reference 3). The PTLR would use the WCAP methodology along with station specific instrument uncertainty analyses per Instrument of America (ISA) Standard S67.04-1994. The generation of the LTOPS setpoints would also include implementation of ASME Code Case N-514. This would ensure that the reactor pressure vessel is protected from brittle fracture but would allow for adequate operational flexibility between the maximum allowed LTOPS RCS pressure and the minimum RCS pressure for RCP operation.

Approval of this exemption request to use ASME Code Case N-514 in the development of LTOPS setpoints for use at Byron Station is requested by August 30, 1996.

If you have any questions regarding this correspondence, please contact this office.

Sincerely,



Marcia T. Lesniak  
Nuclear Licensing Administrator

Attachment 1: Code Case N-514, dated February 12, 1992

Attachment 2: "Request to use American Society of Mechanical Engineer's Code Case N-514 in the Determination of Low Temperature Overpressure Protection System Setpoints for Braidwood Station Units 1 and 2," NRC Docket Nos. 50-456/457, D. M. Saccomando - ComEd to NRR, dated November 30, 1994.

Attachment 3: "Clarification of Information Regarding Braidwood Station's Request to use American Society of Mechanical Engineers Code Case N-514 in the Determination of Low Temperature Overpressure Protection System Setpoints," NRC Docket Nos. 50-456/457, D. M. Saccomando - ComEd to NRR, dated May 11, 1995.

cc: G. Dick, Byron Project Manager-NRR  
H. Peterson, Senior Resident Inspector-Byron  
H. Miller, Regional Administrator-RIII  
Illinois Department of Nuclear Safety-IDNS

## ATTACHMENTS

Code Case N-514, dated February 12, 1992

"Request to use American Society of Mechanical Engineer's Code Case N-514 in the Determination of Low Temperature Overpressure Protection System Setpoints for Braidwood Station Units 1 and 2," NRC Docket Nos. 50-456/457, D. M. Saccomando - ComEd to NRR, dated November 30, 1994.

"Clarification of Information Regarding Braidwood Station's Request to use American Society of Mechanical Engineers Code Case N-514 in the Determination of Low Temperature Overpressure Protection System Setpoints," NRC Docket Nos. 50-456/457, D. M. Saccomando - ComEd to NRR, dated May 11, 1995.

CASES OF ASME BOILER AND PRESSURE VESSEL CODE

Approval Date: February 12, 1992

See Numerical Index for expiration  
and any reaffirmation dates.

Case N-514

Low Temperature Overpressure Protection  
Section XI, Division 1

*Inquiry:* Section XI, Division 1, IWB-3730, requires that during reactor operation, load and temperature conditions be maintained to provide protection against failure due to the presence of postulated flaws in the ferritic portions of the reactor coolant pressure boundary. For those plants having low temperature overpressure protection (LTOP) systems, what load and temperature conditions under IWB-3730 may be used to provide protection against failure during reactor start-up and shutdown operation due to low temperature overpressure events that have been classified as Service Level A or B events?

*Reply:* It is the opinion of the Committee that for those plants having LTOP systems the following load and temperature conditions may be used to provide

protection against failure during reactor start-up and shutdown operation due to low temperature overpressure events that have been classified as Service Level A or B events. LTOP systems shall be effective at coolant temperatures less than 200°F or at coolant temperatures<sup>1</sup> corresponding to a reactor vessel metal temperature<sup>2</sup> less than  $RT_{NDT} + 50^\circ\text{F}$ , whichever is greater. LTOP systems shall limit the maximum pressure in the vessel to 110% of the pressure determined to satisfy Appendix G, para. G-2215 of Section XI, Division 1.

<sup>1</sup> The coolant temperature is the reactor coolant inlet temperature.

<sup>2</sup> The vessel metal temperature is the temperature at a distance one-fourth of the vessel section thickness from the inside surface in the vessel beltline region.  $RT_{NDT}$  is the highest adjusted reference temperature for weld or base metal in the beltline region at a distance one-fourth of the vessel section thickness from the vessel inside surface, as determined by Regulatory Guide 1.99, Rev. 2.



Commonwealth Edison  
1400 Opus Place  
Downers Grove, Illinois 60515

November 30, 1994

Office of Nuclear Reactor Regulation  
U. S. Nuclear Regulatory Commission  
Washington D.C. 20555

Attention: Document Control Desk

Subject: Request to Use American Society of Mechanical Engineers Code Case N-514 in the Determination of Low Temperature Overpressure Protection System Setpoints.

Braidwood Station Units 1 and 2  
NPF-72/77; NRC Docket Nos. 50-456/457

Commonwealth Edison (ComEd) requests approval, per Title 10 Code of Federal Regulations, Section 55a, Subsection a, paragraph 3 (10 CFR 50.55a (a)(3)) to use American Society of Mechanical Engineers (ASME) Section XI Code Case N-514, "Low Temperature Overpressure Protection Section XI, Division 1," in the determination of Low Temperature Overpressure Protection System (LTOPS) Setpoints for Braidwood Nuclear Station Units 1 and 2.

Code Case N-514 was approved by ASME on February 12, 1992. Although the use of this Code Case is currently not referenced in Regulatory Guide 1.147, "Inservice Inspection Code Case Acceptability," Revision 10, dated July, 1993, the guidance in Code Case N-514 has been incorporated into the 1993 Addenda to the ASME Boiler and Pressure Vessel Code, Section XI, Appendix G.

Code Case N-514 provides guidance on when LTOPS shall be in effect, and the maximum pressure to which LTOPS shall limit Reactor Vessel pressure. In particular, Code Case N-514 states: "LTOP systems shall limit the maximum pressure in the vessel to 110% of the pressure determined to satisfy Appendix G paragraph G-2215 of Section XI, Division 1." A copy of Code Case N-514 has been included with this request as Attachment 1.

ComEd has reviewed Code Case N-514 and determined that its use would provide an acceptable level of quality and safety. There are many conservatisms incorporated into the pressure-temperature (PT) limits calculated using the current methodology of ASME Code Section XI Appendix G. The ASME explicitly recognized the amount of margin inherent in the Appendix G PT limits by incorporating Code Case N-514 in the 1993 Addenda to ASME Code Section XI Appendix G. Use of this code case will not result in any design changes to Braidwood Station. No new equipment will be installed and no existing equipment will be modified or removed. The LTOPS system will still function to limit Reactor Pressure Vessel pressure and the use of Code Case N-514 will still ensure that the Reactor Pressure Vessel is protected from brittle fracture.

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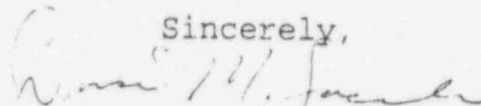
November 30, 1994

Compliance with the current requirements for determination of LTOPS setpoints included in 10 CFR 50 Appendix G results in hardships for Braidwood Station without a concurrent increase in the level of quality and safety. Application of the current LTOPS setpoint determination method reduces operating flexibility by reducing the margin between the maximum allowed Reactor Coolant System (RCS) pressure and the minimum RCS pressure for Reactor Coolant Pump (RCP) operation with no concurrent increase in protection against non-ductile failure of the Reactor Pressure Vessel. The current methodology also increases the likelihood of LTOPS actuation at lower setpoints, and reduces the amount of separation of the setpoints for the Power Operated Relief Valves (PORV) used in the LTOPS system. This endangers the RCP seals as actuation of LTOPS at setpoints determined by the current methodology may cause RCS pressure to drop below the minimum needed to maintain proper RCP seal differential pressure.

Approval of this request to use Code Case N-514 in the determination of LTOPS setpoints is necessary to allow Braidwood Station to obtain approval of new LTOPS Technical Specification curves which will be submitted in a future Technical Specification Amendment request. These curves allow Braidwood Unit 1 to exceed 5.37 Effective Full Power Years (EFPY) of operation. Braidwood is currently predicted to reach 5.37 EFPY on July 16, 1995. Accordingly, ComEd requests that this request to use Code Case N-514 in the determination of LTOPS setpoints be approved prior to July 10, 1995.

Please direct any questions to this office.

Sincerely,



Denise M. Saccomando  
Nuclear Licensing Administrator

Attachment

cc: R. R. Assa, Braidwood Project Manager - NRR  
S. G. DuPont, Senior Resident Inspector - Braidwood  
J. B. Martin, Regional Administrator - RIII  
Office of Nuclear Safety- IDNS

May 11, 1995

Office of Nuclear Regulation  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555



Attn: Document Control Desk

Subject: Clarification of Information Regarding Braidwood  
Stations Request to Use American Society of Mechanical  
Engineers Code Case N-514 in the Determination of Low  
Temperature Overpressure Protection System Setpoint

Braidwood Station Units 1 and 2  
NRC Docket Numbers 50-456/457

- References:
1. D. Saccomando letter to NRC dated November 30, 1994, "Transmitting Request to Use ASME Code Case N-514"
  2. D. Saccomando letter to NRC dated December 16, 1995, transmitting Technical Specification Amendment Request for Nominal PORV Pressure Relief Setpoint Versus RCS Temperature for the Cold Overpressure Protection System
  3. Teleconference dated May 2 between Commonwealth Edison Company and the Nuclear Regulatory Commission Regarding the December 16, 1995, Technical Specification Submittal

During the Reference Teleconference it was noted that Commonwealth Edison Company (ComEd) needed to clarify that it is requesting an exemption request per 10CFR50.12 to use American Society of Mechanical Engineers (ASME) Section XI Code Case N-514, "Low Temperature Overpressure Protection Section XI, Division 1," in the determination of Low Temperature Overpressure Protection System (LTOPS) Setpoints for Braidwood Nuclear Station Units 1 and 2.

10CFR50.12(a)(2)(iii) allows for the Commission to consider granting an exemption under special circumstances; specifically, if compliance would result in undue hardship. As stated in Reference letter 1,

"Compliance with the current requirements for determination of LTOPS setpoints included in 10CFR50 Appendix G results in hardships for Braidwood Station without a concurrent increase in the level of quality and safety. Application of the current LTOPS setpoint determination method reduces operating flexibility by reducing the margin between the maximum allowed Reactor Coolant System (RCS) pressure and

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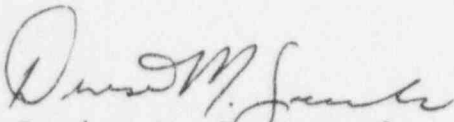
May 11, 1995

the minimum RCS pressure for Reactor Coolant Pump (RCP) operation with no concurrent increase in protection against non-ductile failure of the Reactor Pressure Vessel. The current methodology also increases the likelihood of LTOPS actuation at lower setpoints, and reduces the amount of separation of the setpoints for the Power Operated Relief Valves (PORV) used in the LTOPS system. This endangers the RCP seals as actuation of LTOPS at setpoints determined by the current methodology may cause RCS pressure to drop below the minimum needed to maintain proper RCP seal differential pressure."

Approval of this request to use Code Case N-514 in the determination of LTOPS setpoints is necessary to allow Braidwood Station to obtain approval of new LTOPS Technical Specification curves which was submitted in Reference 2.

If you have any questions regarding this correspondence, please contact this office.

Sincerely,



Denise M. Saccomando  
Nuclear Licensing Administrator

cc: R. Assa, Braidwood Project Manager-NRR  
S. Dupont, Senior Resident Inspector-Braidwood  
J. Martin, Regional Administrator-RIII  
Office of Nuclear Safety-IDNS