

Paul H. Kinkel  
Vice President

Consolidated Edison Company of New York, Inc.  
Indian Point Station  
Broadway & Bleakley Avenue  
Buchanan, NY 10511  
Telephone (914) 734-5340  
Fax: (914) 734-5923

October 7, 1997

Re: Indian Point Unit No. 2  
Docket No. 50-247

Document Control Desk  
US Nuclear Regulatory Commission  
Mail Station P1-137  
Washington, DC 20555

SUBJECT: Request for Exemption from the Requirements of 10 CFR 50.60, "Acceptance Criteria for Fracture Prevention Measures for Lightwater Nuclear Power Reactors for Normal Operation" to use the 1996 Addenda of ASME Section XI, Appendix G, Article G-2000 "Vessels"

Consolidated Edison Company of New York, Inc. (Con Edison) requests an exemption in accordance with 10 CFR 50.12 from the requirements of 10 CFR 50.60 "Acceptance Criteria for Fracture Prevention Measures for Lightwater Nuclear Power Reactors for Normal Operation" to use the 1996 Addenda of ASME Section XI, Appendix G, Article G-2000 "Vessels" in the determination of allowable pressure-temperature (P-T) limits for Indian Point Unit 2. 10 CFR 50.12(a)(1) allows the Commission to grant exemptions if they, "...will not present an undue risk to the public health and safety, and are consistent with the common defense and security." Also, 10 CFR 50.12(a)(2)(ii) allows an exemption if, "application of the regulation in the particular circumstances would not serve the underlying purpose of the rule or is not necessary to achieve the underlying purpose of the rule".

Pursuant to 10 CFR 50.12(a), Con Edison requests an exemption from the requirements of 10 CFR 50.60. 10 CFR 50.60 requires licensees to "...meet the fracture toughness and material surveillance program requirements for the reactor coolant pressure boundary set forth in Appendices G and H to this part." 10 CFR 50 Appendix G, Section I, instructs use of sections, editions and Addenda of the ASME Boiler and Pressure Vessel Code specified in 10 CFR 50.55a. 10 CFR 50.55a states that "...references to Section XI of the ASME Boiler and Pressure Vessel Code refer to Section XI, Division 1, and include addenda through the 1988 Addenda and editions through the 1989 Edition..."

10 CFR 50 Appendix G, paragraph IV.A.2.b requires that the P-T limits for the reactor pressure vessel "...must be at least as conservative as limits obtained by following the methods of analysis and the margins of safety of Appendix G of Section XI of the ASME Code."

Con Edison, requests use of the alternative rules of the 1996 Addenda to ASME Section XI, Appendix G, Article G-2000 in the development of all future P-T limits for Indian Point Unit 2.

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Criteria for Granting Exemptions Are Met per 10 CFR 50.12(a)(1)

1. The requested exemptions and the activities which would be allowed thereunder are authorized by law

If the criteria established in 10 CFR 50.12(a) are satisfied, as they are in this case, and if no other prohibition of law exists to preclude the activities which would be authorized by the required exemption, and there are no such prohibitions, the Commission is authorized by law to grant this exemption request.

2. The requested exemption will not present undue risk to the public health and safety

The proposed exemption request has no impact on the safe operation of the facility. Exemption from the requirements of 10 CFR 50.60 would allow for the use of the 1996 Addenda to ASME Section XI Appendix G. This Addenda allows for a more accurate characterization of the stress conditions of the material without impacting ASME Section XI safety margins. As such, the required exemption will not present undue risk to the public health and safety.

3. The requested exemption is consistent with the common defense and security

The proposed exemption request from 10 CFR 50.60 involves adoption of the most recent Addenda to ASME Section XI Appendix G. It will not affect the safe operation of the facility. As such, the common defense and security are unaffected by the proposed exemption request.

At least one of the special circumstances are present per 10 CFR 50.12(a)(2)(ii).

Application of the regulation in the particular circumstances would not serve the underlying purpose of the rule or is not necessary to achieve the underlying purpose of the rule.

The 1989 Edition of ASME Section XI, Appendix G is the most recent Edition permitted for use by 10 CFR 50.55a. However, the 1996 Addenda to ASME Section XI, Appendix G, Article G-2000 was approved by ASME on December 31, 1996. Section XI, Appendix G, Article G-2000 provides a procedure for obtaining the allowable loading for ferritic pressure retaining materials in vessels, which are expressed in the form of P-T limits. With the 1996 Addenda, Article G-2000 was revised to incorporate the most recent elastic solutions for the Mode I stress intensity factor ( $K_I$ ) due to pressure and radial thermal gradients. These new solutions better characterize the conditions for irradiated vessels in the low temperature region where the thermal stresses and allowable pressure are low. Using the most recent elastic solutions will provide some relief from the restrictions associated with reactor operation at relatively low temperature. Although the relief is relatively in terms of absolute allowable pressure, the benefits are substantial; even a small increase in the allowable pressure can be a significant percentage increase in the operating window at relatively low temperature.

Con Edison has reviewed the 1996 Addenda to ASME Section XI, Appendix G, Article G-2000, and determined that its use would provide an acceptable level of quality and safety. There are many conservatisms incorporated into the P-T limits

calculated using the current methodology of ASME Section XI, Appendix G, Article G-2000 including:

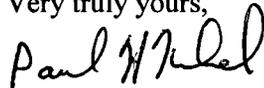
- o An assumed flaw in the wall of the reactor vessel has a depth equal to 1/4 of the thickness of the vessel wall and a length equal to 1-1/2 times the vessel wall thickness,
- o A factor of 2 is applied to the membrane stress intensity factor,
- o The limiting toughness is based upon a reference value, which is a lower bound of the dynamic crack initiation or arrest toughness, and
- o 2-sigma margins are applied in determining the adjusted reference temperature (ART) in accordance with Regulatory Guide 1.99, Revision 2.

None of these conservatisms are compromised by this proposed change. Use of the 1996 Addenda to ASME Section XI, Appendix G, Article G-2000 will not result in any design changes or plant modifications. Protection from nonductile failure will still be assured, which is the underlying purpose of the rule.

Con Edison intends to implement the 1996 Addenda to ASME Section XI, Appendix G, Article G-2000 once approval is received from the Staff. This addenda along with surveillance data integration required by 10 CFR 50.61 will be used to revise the P-T limits which have been submitted via separate correspondence. This will ensure that the reactor pressure vessel is protected from nonductile failure, and at the same time, will allow for improved operational flexibility between the maximum allowed P-T and LTOPS pressures and the minimum RCS pressure required for RCP operation.

Con Edison respectfully requests expedited review of this exemption request to use the 1996 Addenda to ASME Section XI, Appendix G, Article G-2000 in the development of all future P-T limits for Indian Point Unit 2. Should you have any questions regarding this matter, please contact Mr. Charles W. Jackson, Manager, Nuclear Safety and Licensing.

Very truly yours,



C: Mr. Hubert J. Miller  
Regional Administrator - Region I  
US Nuclear Regulatory Commission  
475 Allendale Road  
King of Prussia, PA 19406

Mr. Jefferey F. Harold, Project Manager  
Project Directorate I-1  
Division of Reactor Projects I/II  
US Nuclear Regulatory Commission  
Mail Stop 14B-2  
Washington, DC 20555

Senior Resident Inspector  
US Nuclear Regulatory Commission  
PO Box 38  
Buchanan, NY 10511