



J. Phillip Bayne
First Executive Vice President
Chief Operations Officer

April 1, 1985
IPN-85-17

Director of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, DC 20555

Attention: Mr. Steven A. Varga, Chief
Operating Reactors Branch No. 1
Division of Licensing

Subject: Indian Point 3 Nuclear Power Plant
Docket No. 50-286
Asymmetric Reactor Vessel Blowdown Loads

- References:
- 1) Letter from J. P. Bayne to S. A. Varga dated June 25, 1981 (IPN-81-44) entitled: "Tearing Stability Analysis of the Reactor Coolant System."
 - 2) Letter from J. P. Bayne to S. A. Varga dated October 21, 1981 (IPN-81-82) entitled: "Asymmetric Pressure Vessel Loading."
 - 3) Letter from J. P. Bayne to S. A. Varga dated June 25, 1984 (IPN-84-19) entitled: "Asymmetric Pressure Vessel Loading."
 - 4) Letter from S. A. Varga to C. A. McNeill, Jr. dated December 17, 1984.

Dear Sir:

This letter serves to transmit additional information necessary for the staff to complete its review of the asymmetric pressure vessel loading issue for Indian Point 3.

Reference 1 transmitted a tearing stability analysis of the Indian Point 3 Reactor Coolant System (RCS). This analysis was submitted as justification for not installing the reactor vessel restraints, as described in WCAP-9117. The Authority personnel and its consultant, Fracture Proof Design Corp. (FPDC), presented the Indian Point 3 RCS tearing stability analysis to the staff on September 3, 1981. This presentation was summarized in Reference 2. The consensus of the staff attendees was that additional material property data is necessary.

Reference 3 transmitted proprietary and non-proprietary versions of a report entitled, "Development of Material Property Data for the Tearing Stability Analysis of the Indian Point 3 Primary Coolant System," which provided the

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PDR

w/ check \$150
150337

PA01
1/5 Prop
1/5 NP

Change: 2POR } Non Prop
POR }

Add: NSIC - 4tr & Non Prop

Mr. Steven A. Varga

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Page 2

requested additional material property data in the form of tearing resistance curves representative of forged stainless pipe, cast stainless elbows and several weld types.

The staff has reviewed the analyses transmitted by References 1 and 3 and has concluded that the approach taken by the Authority to demonstrate piping integrity differs from the recommended staff approach and that additional information is necessary. The areas in which additional information is requested are loads and pipe geometry, leak detection system, leakage-size crack, and analysis methods. Enclosed are five copies of the proprietary and non-proprietary versions of the report, "Summary of the Tearing Stability Analysis of the Indian Point 3 Primary Coolant System, Rev. 1," which provides the requested information. The design loads and the corresponding stresses at the limiting locations for the Indian Point 3 RCS piping are provided by Section 5-1.2 of the enclosed report. A description of the leak detection system and its capability is provided by Section 5.2-2 and Appendix D to the enclosed report. An assessment of the stability of leakage-size cracks, following the guidelines set forth in NUREG-1061, Vol. 3, "Report of the U.S. Nuclear Regulatory Commission Piping Review Committee - Evaluation of Potential for Pipe Breaks", is provided by Section 5.3. A description of the JPIPE computer code, which was utilized to determine the stability of large cracks under upper-bound loads, is provided by Appendix A to the enclosed report. The Authority notes that these postulated large cracks and upper-bound loads assumption are much greater than any expected and are provided for information purposes.

The analyses transmitted by References 1 and 3 and by this letter have demonstrated that no leakage-size crack instabilities would occur for the RCS hot leg, cross leg, or cold leg. Therefore, a double-ended guillotine LOCA is not credible. Hence, asymmetric pressure vessel loading cannot occur. Accordingly, pursuant to 10 CFR 50.12 the Authority requests an exemption from General Design Criteria 4 so that the reactor vessel restraints, as described in WCAP-9117, need not be installed. The bases for this exemption request are set forth in Attachment I to this letter.

The enclosed proprietary report is a revision to the proprietary report, of the same title, transmitted by Reference 3. As there have been no revisions to the proprietary sections of the report, the Application for Withholding from Public Disclosure and the Affidavit in support of the original report apply to the enclosed report. Accordingly, it is requested that the information which is proprietary to FPDC, the owner of the information, be withheld from public disclosure in accordance with 10 CFR 2.790. Correspondence with respect to the proprietary aspects of the Application for Withholding or the supporting Affidavit should be addressed to K. H. Cotter, President, Fracture Proof Design Corporation, 77 Maryland Plaza, St. Louis, Missouri, 63108.

Mr. Steven A. Varga

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Pursuant to 10 CFR 170.21, enclosed is a check in the amount of \$150.00 in payment of the application fee for the review of this request for exemption from General Design Criteria 4.

Should your or your staff have any questions regarding this matter, please contact Mr. P. Kokolakis of my staff.

Very truly yours,



J. P. Bayne
First Executive Vice President
Chief Operations Officer

cc: Resident Inspector's Office
Indian Point Unit 3
U. S. Nuclear Regulatory Commission
Buchanan, New York 10511

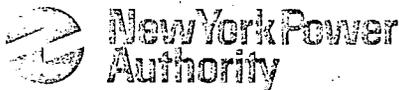
ATTACHMENT I TO IPN-85-17
Bases For Exemption Request

New York Power Authority
Indian Point 3 Nuclear Power Plant
Docket No. 50-286

Bases For Exemption Request

Pursuant to the resolution of Unresolved Safety Issue A-2, "Asymmetric Blowdown Loads on Reactor Primary Coolant Systems," the Authority has applied advanced fracture mechanics technology which demonstrated that postulated leakage-size cracks in the Reactor Coolant System (RCS) piping will remain stable and will be detected by the leakage monitoring system. The large margins against unstable crack extension are such that the double-ended guillotine LOCA need not be postulated as a design basis for defining structural loads on or within the reactor vessel. As such the installation of the reactor vessel restraints as described in WCAP-9117 are not necessary. Accordingly, pursuant to 10CFR50.12 the Authority hereby requests an exemption from General Design Criteria 4, so that the vessel restraints need not be installed.

Enclosure 2 to Generic Letter 84-04, "Safety Evaluation of Westinghouse Topical Reports Dealing with Elimination of Postulated Pipe Breaks in PWR Primary Main Loops," provided a regulatory analysis of mechanistic fracture evaluation of RCS piping. This regulatory analysis assessed the estimated reduction in public risk for installing additional restraints and modifying equipment supports, as necessary, to mitigate asymmetric blowdown loads. If the modifications were installed in lieu of utilizing the advanced fracture mechanics techniques, a small reduction in core melt frequency of 1×10^{-7} events/reactor-year and a slight reduction in accident exposure of 3.5 man-rem total for the nominal case for all 16 plants within the scope of this assessment, would result. The cost to install the reactor vessel restraints has been currently estimated at \$1,500,000. The occupational exposure for installing the reactor vessel restraints has been estimated to be 200 man-rem. The savings in capital expenditure and occupational exposure by not requiring the installation of the reactor vessel restraints exceed the potentially small decrease in public risk and avoided accident exposure gained by installing the restraints. Based on this assessment, the proposed exemption request will not give rise to a significant adverse impact on the public health and safety.



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PDR

w/ check \$150
150337

PA01
15 Prop
15 NP

Change: LPOR } Non Prop
POR }

Add: NSIC - 4tr & Non Prop

Mr. Steven A. Varga

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4/1/85
Asymmetric loads

Bases For Exemption Request

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