Entergy

Entergy Nuclear Northeast
Indian Point Energy Center
450 Broadway, GSB
P.O. Box 249
Buchanan, NY 10511-0249
Tel 914 734 6700

Fred Dacimo
Site Vice President
Administration

February 11, 2005

Re: Indian Point Unit 3
Docket No. 50-286
NL-05-020

Document Control Desk
U.S. Nuclear Regulatory Commission
Mail Stop O-P1-17
Washington, DC 20555-0001

Subject: **Reply to RAI Regarding Indian Point 3 License Amendment Requests for Stretch Power Uprate (TAC MC3552) and Alternate Source Term (TAC MC3551)**

References:
1. Entergy letter NL-04-069 to NRC, dated June 3, 2004; regarding Stretch Power Uprate license amendment request.
2. Entergy letter NL-04-068 to NRC, dated June 2, 2004; regarding Alternate Source Term license amendment request.
3. Entergy letter NL-05-013 to NRC, dated January 28, 2005; regarding reply to RAI for Alternate Source Term license amendment request.

Dear Sir:

Entergy Nuclear Operations, Inc (Entergy) is submitting additional information to support NRC review of the stretch power uprate (SPU) license amendment request (Reference 1) and the alternate source term (AST) license amendment request (Reference 2) for Indian Point 3 (IP3). This information is being provided as discussed with the NRC staff during teleconferences on January 27 and February 11, 2005.

The proprietary response to the SPU RAI regarding steam generator structural integrity is provided in Attachment 1. The non-proprietary version of this response is provided in Attachment 2.

As Attachment 1 contains information proprietary to Westinghouse Electric Company, it is supported by an affidavit signed by Westinghouse, the owner of the information. The affidavit sets forth the basis on which the information may be withheld from public disclosure by the Commission and addresses with specificity the considerations listed in paragraph (b)(4) of Section 2.390 of the Commission's regulations. Accordingly, it is respectfully requested that the information that is proprietary to Westinghouse be withheld from public disclosure in accordance with 10 CFR 2.390 of the Commission's regulations. Westinghouse authorization letter dated February 9, 2005 (CAW-05-1951), with the accompanying affidavit, Proprietary Information Notice, and Copyright Notice is provided in Enclosure A.

AP01

Correspondence with respect to the copyright on proprietary aspects of the items listed above or the supporting affidavit should reference CAW-05-1951 and should be addressed to J. A. Gresham, Manager, Regulatory Compliance and Plant Licensing, Westinghouse Electric Company LLC, P. O. Box 355, Pittsburgh, Pennsylvania 15230-0355.

Attachments 3, 4, 5 and 6 provide a correction to information previously included in Reference 3 regarding the AST amendment request. Attachment 3 is ABS Consulting Report, R-1109298-01, Revision 4, dated February 2, 2005. This revision reflects a correction to certain release point elevations as discussed during the conference call of January 27, 2005. As a result of this revision, corrections to previously reported X/Q values are also required. Attachments 4 and 5 pertain to SPU and provide updated errata pages for WCAP-16212-P and WCAP-16212-NP, respectively. Since there is no proprietary information on any of these pages, an application for withholding is not required for these replacement pages. Attachment 6 pertains to AST and provides updated errata pages for AST. The previously reported dose results for SPU and AST are not affected by this correction.

Responses to other questions regarding the AST amendment request are provided in Attachment 7.

Attachment 8 contains a new commitment being made by Entergy and a proposed license condition to address other topics discussed during conference calls with the staff.

The additional supporting information and errata pages provided in this letter do not alter the conclusions of the no significant hazards evaluations that support the SPU and AST license amendment requests. If you have any questions or require additional information, please contact Mr. Kevin Kingsley at (914) 734-6695.

I declare under penalty of perjury that the foregoing is true and correct. Executed on 2/11/2005

Sincerely,

FOR

Fred R. Dacimo
Site Vice President
Indian Point Energy Center

Attachment 1: Reply to SPU RAI regarding steam generator structural integrity, Proprietary
Attachment 2: Reply to SPU RAI regarding steam generator structural integrity, Non-Proprietary
Attachment 3: ABS Consulting Report R-1109298-01, Revision 4 dated February 2, 2005.
Attachment 4: Updated Errata pages for Indian Point Nuclear Generating Unit 3 Stretch Power Uprate, WCAP-16212-P.
Attachment 5: Updated Errata pages for Indian Point Nuclear Generating Unit 3 Stretch Power Uprate, WCAP-16212-NP
Attachment 6: Updated Errata pages for Indian Point Nuclear Generating Unit 3 Alternate Source Term.
Attachment 7: Response to Questions regarding Indian Point Nuclear Generating Unit 3 Alternate Source Term.
Attachment 8: Commitment List
Enclosure A: Westinghouse Authorization Letter Dated February 9, 2005 (CAW-05-1951), with accompanying affidavit, Proprietary Notice, and Copyright Notice

cc: Mr. Patrick D. Milano, Senior Project Manager (w/ all Attachments and Encl)
Project Directorate I
Division of Licensing Project Management
U.S. Nuclear Regulatory Commission
Mail Stop O 8 C2
Washington, DC 20555-0001

Mr. Samuel J. Collins (w/o Attachments 1 and 4 and Encl A)
Regional Administrator, Region 1
U.S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406-1415

Resident Inspector's Office (w/o Attachments 1 and 4 and Encl A)
Indian Point Unit 3
U.S. Nuclear Regulatory Commission
P.O. Box 337
Buchanan, NY 10511-0337

Mr. Peter R. Smith, President (w/o Attachments 1 and 4 and Encl A)
New York State Energy, Research
and Development Authority
17 Columbia Circle
Albany, NY 12203

Mr. Paul Eddy (w/o Attachments 1 and 4 and Encl A)
New York State Dept. of Public Service
3 Empire State Plaza
Albany, NY 12223-6399

ATTACHMENT 2 TO NL-05-020

REPLY TO RAI REGARDING STEAM GENERATOR STRUCTURAL INTEGRITY

FOR IP3 STRETCH POWER UPRATE LICENSE AMENDMENT REQUEST

(NON-PROPRIETARY VERSION)

ENTERGY NUCLEAR OPERATIONS, INC.
INDIAN POINT NUCLEAR GENERATING UNIT NO. 3
DOCKET NO. 50-286

Westinghouse Non-Proprietary Class 3

NRC RAI

The response to NRC RAI SI-3 indicates that the basis for the determination of acceptability of smaller flaw sizes (see footnote 1 of Table 5.9-4) is EPRI Report, "Justification for the Reduction of Inspection Requirements for the Boiling Water Reactor Nozzle-to-Vessel Shell Welds And Nozzle Blend Radii (VIP-108)", R. Carter, June 2002. NRC is reviewing this report at this time and does not expect to complete that review until September 2005. Therefore this is not an acceptable reference for demonstrating that flaws of the sizes indicated can be reliably detected by NDE techniques. Please provide a reference that has been accepted by NRC.

Entergy Response:

In lieu of a different reference for demonstrating that flaws of the sizes indicated can be reliably detected by NDE techniques, Entergy has chosen to recalculate the limiting location flaw depth using the Raju & Newman methods (Reference 1).

Steam Generator—The procedures of ASME Appendix G (Reference 2) were applied only to the primary side critical components in the steam generators. The Model 44F replacement steam generator fracture mechanics analysis is applicable to the IP3 steam generators. Since hydrostatic tests are the governing transients for the critical steam generator components, those portions of the replacement Model 44F Appendix G evaluations still remain valid for the SPU. Only normal/upset conditions were affected by the SPU, therefore, only the affected normal/upset conditions were evaluated for the critical steam generator components (Tubesheet and Shell Junction) as part of the SPU.

The stress intensity factors were calculated using the Raju & Newman methods (Reference 1) with a safety factor of 2 applied to the primary stresses per ASME Appendix G (Reference 2). Stress intensity factors can be expressed in the general form as follows (Reference 1):

$$K_I = \left(\frac{\pi a}{Q}\right)^{0.5} \sum_{j=0}^{3} G_j(a/c, a/t, t/R, \Phi)\, A_j\, a^j$$

where:

- a: Crack Depth
- c: Half Crack Length Along Surface
- t: Thickness of Cylinder
- R: Inside Radius
- ϕ: Angular Position of a Point on the Crack Front
- G_j: G_0, G_1, G_2, G_3 are boundary correction factors (from Reference 1)
- Q: Shape Factor $= \int_0^{\pi/2} \left(\cos^2\Phi + \frac{a^2}{c^2}\sin^2\Phi\right)^{1/2} d\Phi$

The Model 44F steam generator stress report was used as the baseline for assessing the effects of the SPU. The primary and secondary through-wall stresses were added after applying a safety factor of 2 to the primary stresses, and the stress intensity factors were calculated using the combined through-wall stresses. The calculated K_I was then adjusted to incorporate the changes described in Section 5.6 of WCAP-16212-P for the affected normal/upset transients. The temperatures for the affected transients are always at least 300°F, so the shell material is always in the upper shelf range of fracture toughness, which is 200 ksi$\sqrt{in.}$, as for the reactor vessel.

The fracture integrity evaluations completed for the SPU for the IP3 steam generators have shown that these components are in compliance with the fracture integrity design requirements of Appendix G (Reference 2). The steam generator Appendix G analyses were modified to account for the SPU changes and the limiting location flaw depth is 1/4t.

Fracture Integrity Evaluation Summary for SPU Normal/Upset Transients
IP3 – Steam Generators

Location	Thickness (in.)	Min. Temp. (°F)	RT_{NDT} (°F)	Flaw Depth (in.)	K_I (ksi$\sqrt{in.}$)	K_{IR} (ksi$\sqrt{in.}$)
Tubesheet and Shell Junction	5.22	[	]^{a,c,e}	1/4t	[ ]^{a,c,e}	200

Note:
Bracketed [ ]^{a,c,e} information designates data that is Westinghouse Proprietary.

1. ASME publication PVP. Vol 58, "Stress Intensity Factor Influence Coefficients for Internal and External Surface Cracks in Cylindrical Vessels," 1982, Raju, I. S. and Newman, J. C.

2. *ASME Boiler and Pressure Vessel Code*, Section III, "Nuclear Power Plant Components," 1998 Edition for Appendix G, The American Society of Mechanical Engineers, New York, NY.

ATTACHMENT 3 TO NL-05-020

REVISED ABS CONSULTING REPORT, R-1109298-01, REVISION 4
(FEBRUARY 2, 2005)

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INDIAN POINT NUCLEAR GENERATING UNIT NO. 3
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