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NewYorkPower Authority

William J. Cahill, Jr.
Chief Nuclear Officer

November 20, 1995
IPN-95-121

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555-0001

Subject: Indian Point 3 Nuclear Power Plant
Docket No. 50-286
Generic Letter 92-01, Revision 1, Supplement 1
Reactor Vessel Structural Integrity - Six Month Response

References:
1. NRC Generic Letter 92-01, Revision 1, Supplement 1, "Reactor Vessel Structural Integrity," dated May 19, 1995.
2. NYPA letter, W. J. Cahill, Jr. to USNRC (IPN-95-088/JPN-95-038), "Reactor Vessel Structural Integrity," dated August 16, 1995.
3. NYPA letter, W. A. Josiger to NRC (IPN-94-076), "Generic Letter 92-01, Revision 1: Reactor Vessel Structural Integrity (TAC M83473)," dated June 27, 1994.

Dear Sir:

The NRC requested (Reference 1) licensees to identify, collect, and report any new data pertinent to analyses of structural integrity of their reactor pressure vessels (RPV), and to assess the impact of that data on their RPVs integrity analyses. A response to Part 1 of the generic letter, which requested licensees to provide a description of those actions taken or planned to locate all data relevant to the determination of RPV integrity, was submitted in Reference 2. The additional information requested (Parts 2, 3, and 4) in the generic letter is provided in the enclosed attachments. The information regarding the Indian Point 3 Nuclear Power Plant is presented in Attachment 1. Further, the results of the analysis described in Attachment 1 completes a commitment made in Reference 3 regarding the intermediate and lower shell axial welds for the Indian Point 3 RPV.

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The search of available data bases identified additional plant specific RPV weld chemistry data that is consistent with previous weld chemistry used in the RPV structural integrity evaluations. The evaluations, using the new chemistry data, confirm the validity of RPV temperature limits in the current Technical Specifications, and confirm compliance with the structural integrity requirements of 10 CFR 50.60, 10 CFR 50.61, and Appendices G and H to 10 CFR Part 50. Attachment 2 provides a compilation of the plate and weld chemistry data identified, and the calculation of the average chemistry content considered in the evaluations.

If you have any questions, please contact Ms. C. D. Faison.

Very truly yours,

William J. Cahill, Jr.
Chief Nuclear Officer

STATE OF NEW YORK
COUNTY OF WESTCHESTER
Subscribed and sworn to before me
this 20th day of November, 1995.

Geraldine Strand
Notary Public

cc: See next page

GERALDINE STRAND
Notary Public, State of New York
No. 4991272
Qualified in Westchester County
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cc: Regional Administrator - Region I
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ATTACHMENT 1 to IPN-95-121

GENERIC LETTER 92-01, REVISION 1, SUPPLEMENT 1
REACTOR VESSEL STRUCTURAL INTEGRITY - SIX MONTH RESPONSE

for

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

New York Power Authority

Attachment 1 to IPN-95-121

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

Generic Letter 92-01, Revision 1, Supplement 1
Reactor Vessel Structural Integrity - Six Month Response

This report provides a response to information requested in Parts 2, 3, and 4 of NRC Generic Letter 92-01, Revision 1, Supplement 1, for the Indian Point 3 Nuclear Power Plant.

Assessment of Changes in Best-Estimate Chemistry

NRC Request (GL 92-01, Rev. 1, Supp. 1, Part 2):

> Provide an assessment of any change in best-estimate chemistry based on consideration of all relevant data.

Response:

The search of available data bases confirms that the baseplate chemistry (copper-nickel content) remains unchanged. The confirmation consisted of reviewing the actual material certifications from the plate mill, the ABB Combustion Engineering Owners Group (CEOG) Reactor Vessel Group Detailed Fabrication Record Evaluation Program-Component Material Properties Verification Report and, for copper, the Westinghouse Energy Center Equipment Number Group Material Certifications Report. The copper content data is based on ladle analysis values, and the nickel content data is based on check analysis values.

The search of the available data bases resulted in the following changes in the weld chemistry data associated with the circumferential and axial welds in the beltline region:

Heat No. Weld	Previous Copper Content %	Revised Copper Content %	Previous Nickel Content %	Revised Nickel Content %
13253 Circ	0.27	0.210	0.74	0.726
34B009 Int. & Lwr. Shell Axial	0.19	0.184	1.0	0.926

The search located 13 datapoints for Heat No. 13253, and 39 datapoints for Heat No. 34B009. The revised values in the table above were computed by averaging the datapoints. The sources of the weld chemistry data are:

- NRC-Reactor Vessel Integrity Database, Version 1.1, July 1995
- WOG-Reactor Vessel Database RPV Data, September 1995 (pre-release version)
- Manufacturer Material Certifications
- ABB/CE Reactor Vessel Owners Group Records Evaluation Program, Phase II Report MISC-PENG-ER-010, 1995.
- EPRI-RVP Materials Data for Selected Weld Metals.
- General Electric Report NEDC-30299, Fracture Toughness of Reactor Vessel Steel Welds.
- Weld Data from plants with similar reactor vessel material (Millstone 1, Palisades, H. B. Robinson 2, Salem 1 & 2).

See Attachment 2 for a compilation of the plate and weld chemistry data identified, and the calculation of the average chemistry content considered in the evaluation.

Need for the Use of the Regulatory Guide 1.99 Ratio Procedure

NRC Request (GL 92-01, Rev. 1, Supp. 1, Part 3)

> Provide a determination of the need for use of the ratio procedure in accordance with the established Position 2.1 of Regulatory Guide 1.99, Revision 2, for those licensees that use surveillance data to provide a basis for the RPV integrity evaluation.

Response:

Indian Point 3 RPV material evaluations use the ratio procedure to determine chemistry factor (CF) for the limiting baseplate, based on the results of the IP3 Reactor Vessel Surveillance Program and in accordance with Regulatory Guide (RG) 1.99, Rev .2. The evaluation yields a CF of 158.7°F. Using the tables of RG 1.99, Rev. 2, yields a CF of 160.4°F, only slightly higher than the CF determined by the ratio method. Using the higher CF value to calculate the RT_{PTS} yields a slightly higher value (257.3°F vs. 255.5°F) at the expiration of the license. This is still well within the screening criterion of 270°F (10 CFR 50.61(b)(2)) for the limiting baseplate.

Results of Any Revisions to the Evaluation of RPV Integrity

NRC Request (GL 92-01, Rev. 1, Supp. 1, Part 4)

> Provide a written report providing any newly acquired data as specified above and (1) the results of any necessary revisions to the evaluation of RPV integrity in accordance with the requirements of 10 CFR 50.60, 10 CFR 50.61, Appendices G and H to 10 CFR Part 50, and any potential impact on LTOP or P-T limits in the Technical Specifications, or (2) a certification that previously submitted evaluations remain valid. Revised evaluations and certifications should include consideration of Position 2.1 of Regulatory Guide 1.99, Revision 2, as applicable, and any new data.

Response:

Calculations using the new chemistry data discussed above confirm that the Indian Point 3 reactor vessel continues to be baseplate limited, rather than weld limited. Since the baseplate chemistry, and associated RPV temperature limits remain unchanged, the heatup, cooldown, and Low Temperature Overpressure Protection curves in the current IP3 Technical Specifications remain valid.

The new weld chemistry data has no effect on limiting upper shelf energy (USE), or limiting RT_{PTS}, at end of life. However, because both of these parameters are affected by operating history and neutron fluence, the recalculated USE and RT_{PTS} based on revised predictions for end of life are:

RT_{PTS} = 255.55°F (previously 262°F)

Upper Shelf Energy (USE) = 53 ft-lbs (previously 54 ft-lbs)

These values remain within the limits of 270°F maximum for RT_{PTS}, and 50 ft-lbs minimum for USE. The revised values are based on a license expiration date of December 12, 2015, an interim plant capacity factor of 80%, and a conservatively high estimate of neutron fluence on the reactor vessel. By comparison, if a lower capacity factor of 75%, and a more realistic estimate of neutron fluence are used, these values change to 247.17°F and 54 ft-lbs, respectively.

ATTACHMENT 2 to IPN-95-121

REACTOR PRESSURE VESSEL MATERIAL CHEMISTRY DATA

for

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

New York Power Authority

IP3 DATABASE AND PLANT SPECIFIC DATA FOR ANALYSES OF WELD MATERIAL HEAT

13253

ITEM NO.	PLANT NAME	COMPONENTS	PCT Cu	PCT Ni	REF:
1	Indian Point 3	Int./Lower Shell Circ Weld 9–042	0.27	0.74	1, 2, 17
2		Int./Lower Shell Circ. Weld 9–042	0.07	0.72	6, 7, 16, Table 8
3	Fort Calhoun	Lower Shell Axial Welds 3–410 A–C	0.23	0.73	1
4		Lower Shell Axial Welds 3–410 A–C	0.22	0.73	2
5	Hatch 1	Lower Shell Axial Welds 1–307 A–C	0.27	0.74	1, 2, 17
6	Pilgrim	Lower Int./Upper Shell Circ. Weld 3–339 B	0.07	0.72	1, 2, 17
7	Salem 1	Int./Lower Shell Circ. Weld 9–042	0.25	0.72	1, 2, 17
8	D. C. Cook 1	Surveillance Weld	0.27	0.74	2, 4, 17
9		Surveillance Weld	0.25	0.72	5
10	Salem 2	Surveillance Weld	0.23	0.71	2, 3, 4, 13, 14, 15, 17
11		Surveillance Weld	0.25	0.72	5
12		Surveillance Weld	0.28	0.73	14
13	ABB/CE RVG	Sister Vessel Welds	0.07	0.72	16, Table 15

IP3 DATABASE AND PLANT SPECIFIC DATA FOR ANALYSES OF WELD MATERIAL HEAT

34 B009

ITEM NO.	PLANT NAME	COMPONENTS	PCT Cu	PCT Ni	REF:
1	Indian Point 3	Int. Shell Axial Welds 2-042 A-C	0.19	1.00	1, 2, 17
2		Lower Shell Axial Welds 3-042 A-C	0.19	1.00	1, 2, 17
3	Indian Point 2	Int. Lower Shell Circ. Weld 9-042	0.19	0.92	1
4		Int. Lower Shell Circ. Weld 9-042	0.18	1.03	2, 17
5	Millstone 1	Lower/Lower Int. Shell Circ. Weld	0.21	1.03	1, 2, 17
6		Surveillance Weld	0.21	1.03	2, 17
7		Surveillance Weld	0.18	1.04	9
8		Surveillance Weld	0.18	1.02	9
9		Surveillance Weld	0.18	0.94	9
10		Surveillance Weld	0.20	1.05	11
11		Surveillance Weld	0.16	1.78	11
12		Surveillance Weld	0.18	1.03	11
13	Palisades	Lower Shell Axial Weld 3-112 A-C	0.19	0.99	1
14		Lower Shell Axial Weld 3-112 A-C	0.17	0.91	2, 17
15		Nozzle /Int. Shell Circ. Weld 8-112	0.17	0.91	2, 17
16		Steam Generator Welds	0.188	0.98	12
17	H. B. Robinson 2	Int./Lower Circ. Weld 11-273	0.17	0.92	1, 2, 17
18		Torus-To-Dome Weld Analysis	0.19	0.80	4
19		Torus-To-Dome Weld Analysis	0.19	1.00	5
20		Torus-To-Dome Weld Analysis	0.20	0.80	8
21		Torus-To-Dome Weld Analysis	0.187	0.80	10
22		Torus-To-Dome Analysis MT MNA 5004	0.20	N/A	17
23		Torus-To-Dome Analysis MT MNA 5004	0.18	0.75	17
24		Torus-To-Dome Analysis MT MNA 5004	0.18	N/A	17
25		Torus-To-Dome Analysis MTMNA 5004	0.18	0.84	17
26	Salem 1	Lower Shell Axial Welds 3-042 A-C	0.19	1.00	1, 2, 17

IP3 DATABASE AND PLANT SPECIFIC DATA FOR ANALYSES OF WELD MATERIAL HEAT

34 B009

ITEM NO.	PLANT NAME	COMPONENTS	PCT Cu	PCT Ni	REF:
27	GE	NEDC-30299 Test Data	0.14	1.30	17
28		NEDC-30299 Test Data	0.19	0.86	17
29		NEDC-30299 Test Data	0.19	1.06	17
30		NEDC-30299 Test Data	0.20	0.11	17
31		NEDC-30299 Test Data	0.20	0.95	17
32		NEDC-30299 Test Data	0.20	0.99	17
33		NEDC-30299 Test Data	0.18	1.09	17
34		NEDC-30299 Test Data	0.12	1.06	17
35		NEDC-30299 Test Data	0.21	0.08	17
36		NEDC-30299 Test Data	0.20	0.38	17
37		NEDC-30299 Test Data	0.18	0.94	17
38		NEDC-30299 Test Data	0.19	0.96	17
39	CE	CE-78-12 RSP Analysis	0.15	NA	17

REFERENCES

(1) NRC – Reactor Vessel Integrity Database, Version 1.1, July 1995

(2) WOG – Reactor Vessel Database RPV Data, September 11, 1995

(3) WCAP 8824 PSE & G Salem 2 – Radiation Surveillance Program, January 1977

(4) C. E. Salem Units 1 & 2 Reactor Vessel Weld Data, Table 2, November 1985
(5) C. E. Salem Units 1 & 2 Reactor Vessel Weld Data, Table 5, November 1985

(6) Adcom Metals Co., Material Certificate No. 47–45075 (A–098)
(7) Adcom Metals Co., Material Certificate No. 47–43144

(8) CP & L Docket 50–261 "PTS Correction to Response to Final Rule, 10CFR 50.61, para 3.2.2, 2/4/86

(9) GE NEDC–30299 Fracture Toughness of Reactor Vessel Steel Welds, 10/83

(10) CP & L Letter No. CPL 84–070, "Chemical Analysis of Reactor Vessel Head Torus–To–Dome Weld Samples from H. B. Robinson Unit 2," April 1984

(11) GE Report NE–523–165–1292, Rev. 1, February 1993

(12) Consumers Power Company – "Palisades Nuclear plant fax from, J. Kneeland to Sister Utility Working Group Members, 10/13/95

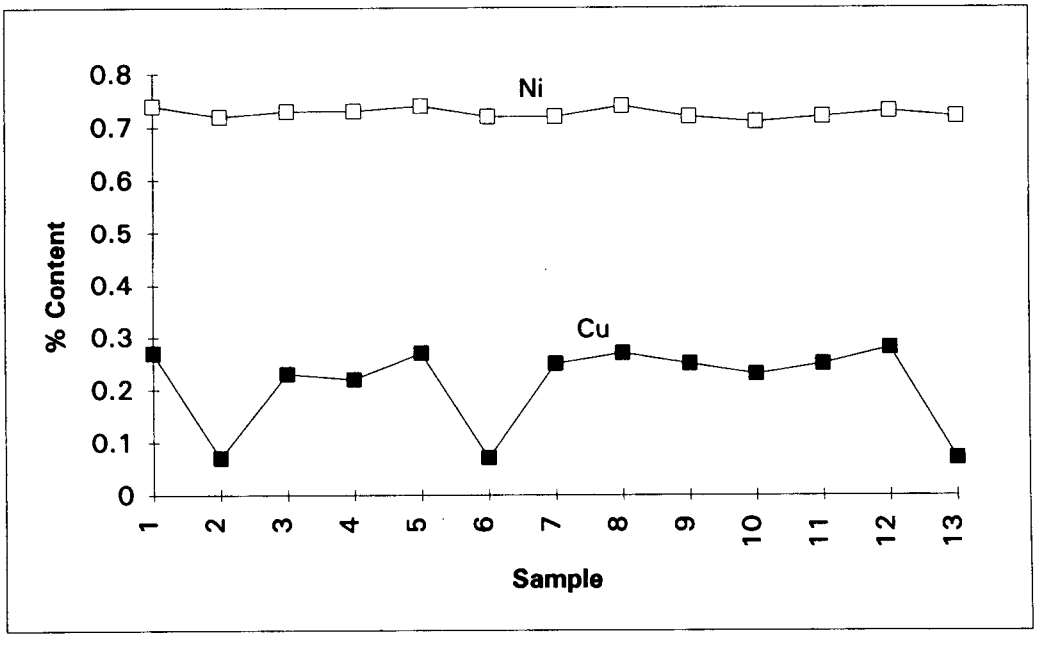
(13) WACP 10492 PSE & G Surveillance Capsule T for Salem Unit 2, March 1984
(14) WACP 11554 PSE & G Surveillance Capsule U for Salem Unit 2, Speptember 1987
(15) WACP 13366 PSE & G Surveillance Capsule X for Salem Unit 2, June 1992

(16) ABB/CE Reactor Vessel Group Records Evaluation Program, Phase II Report MISC–PENG–ER–010, Rev. 0, Tables 8 & 15, January 1995

(17) EPRI Letter "RVP Materials Data for Selected Weld Metals," R. G. Carter to W. H. Spataro, April 17, 1995

IP3 BELTLINE WELD/CHEMISTRY FOR HEAT NUMBER 13253

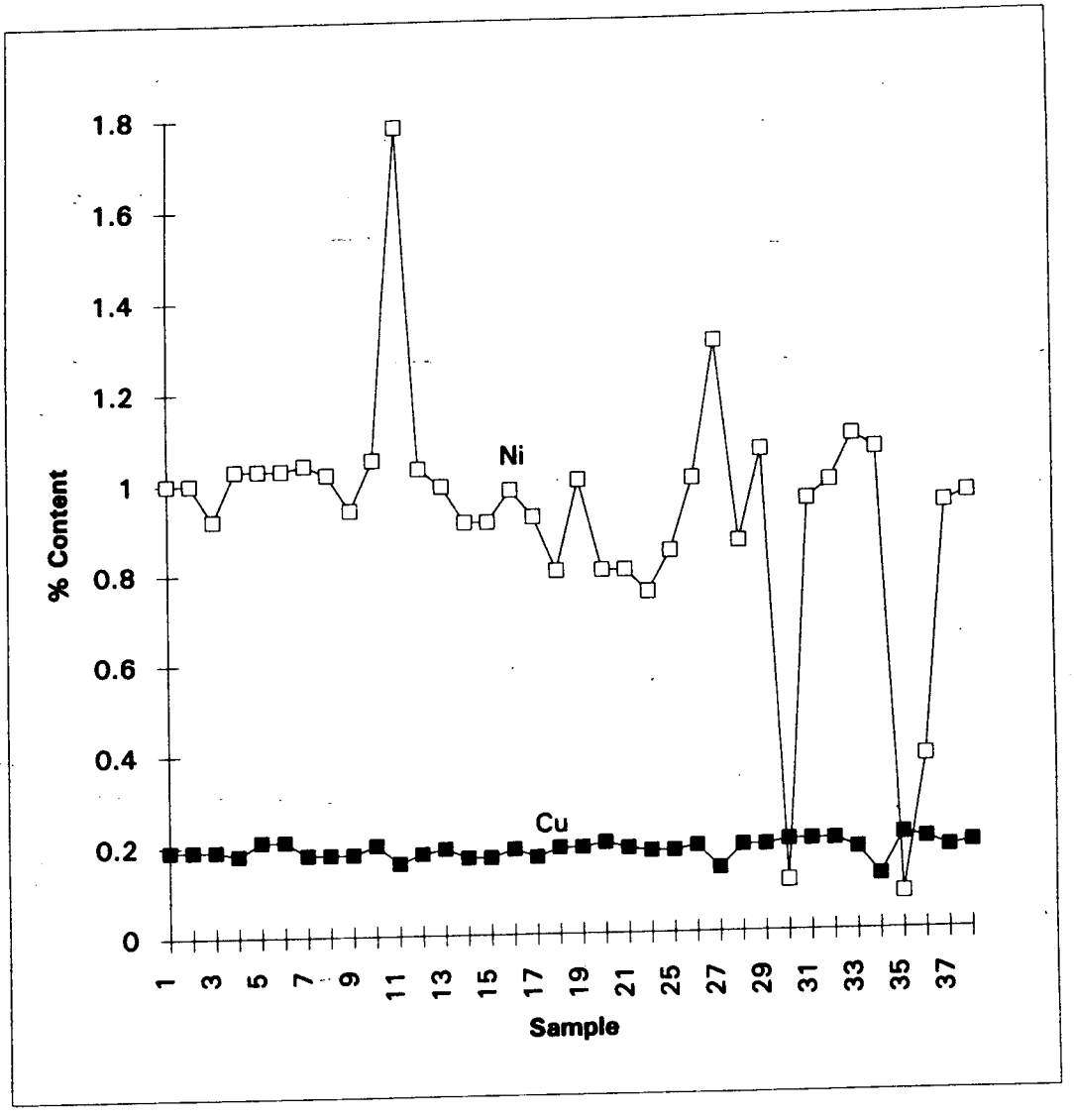
ITEM	% Cu	% Ni
1	0.27	0.74
2	0.07	0.72
3	0.23	0.73
4	0.22	0.73
5	0.27	0.74
6	0.07	0.72
7	0.25	0.72
8	0.27	0.74
9	0.25	0.72
10	0.23	0.71
11	0.25	0.72
12	0.28	0.73
13	0.07	0.72
MEAN	**0.21**	**0.726154**
STDEV	**0.081752**	**0.009608**



IP3 BELTLINE WELD/CHEMISTRY FOR HEAT NUMBER 34B009

ITEM	% Cu	% Ni	
1	0.19	1	
2	0.19	1	
3	0.19	0.92	
4	0.18	1.03	
5	0.21	1.03	
6	0.21	1.03	
7	0.18	1.04	
8	0.18	1.02	
9	0.18	0.94	
10	0.2	1.05	
11	0.16	1.78	
12	0.18	1.03	
13	0.19	0.99	
14	0.17	0.91	
15	0.17	0.91	
16	0.188	0.98	
17	0.17	0.92	
18	0.19	0.8	
19	0.19	1	
20	0.2	0.8	
21	0.187	0.8	
23	0.18	0.75	
25	0.18	0.84	
26	0.19	1	
27	0.14	1.3	
28	0.19	0.86	
29	0.19	1.06	
30	0.2	0.11	
31	0.2	0.95	
32	0.2	0.99	
33	0.18	1.09	
34	0.12	1.06	
35	0.21	0.08	
36	0.2	0.38	
37	0.18	0.94	
38	0.19	0.96	
39	0.15	N/A	* Not plotted on graph
22	0.2	N/A	* Not plotted on graph
24	0.18	N/A	* Not plotted on graph
MEAN	**0.184231**	**0.926389**	
STDEV	**0.018292**	**0.283762**	

IP3 BELTLINE WELD/CHEMISTRY FOR HEAT NUMBER 34B009



Reactor Pressure Vessel Beltline Plate Chemistry

Indian Point 3 Beltline Plate Material Chemistry

Plate Designation	Heat #	%Cu	%Ni
Int. Shell Plate - B2802-1	B-5394-2	**0.20** (l)	0.49 (l), **0.50** (c)
Int. Shell Plate - B2802-2	A-0516-2	**0.22** (l)	0.53 (l), **0.53** (c)
Int. Shell Plate - B2802-3	B-5391-2	**0.20** (l)	0.50 (l), **0.49** (c)
Lwr. Shell Plate - B2803-1	A-0495-2	**0.19** (l)	0.47 (l), **0.47** (c)
Lwr. Shell Plate - B2803-2	C-1397-3	**0.22** (l)	0.51 (l), **0.52** (c)
Lwr. Shell Plate - B2803-3	A-0512-2	**0.24** (l)	0.51 (l), **0.52** (c)

(c) check analysis
(l) ladle analysis