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J. T. Beckham, Jr.
Vice President - Nuclear
Hatch Project

Georgia Power
the southern electric system

July 1, 1994

HL-4636

Docket Nos. 50-321
50-366

TAC Nos. M83469
M83470

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

Edwin I. Hatch Nuclear Plant
Response to Open Issues - Generic Letter 92-01, Revision 1
REACTOR VESSEL STRUCTURAL INTEGRITY

Gentlemen:

On March 6, 1992, the Nuclear Regulatory Commission (NRC) issued Generic Letter (GL) 92-01, Revision 1, titled "Reactor Vessel Structural Integrity." By letter dated July 2, 1992, Georgia Power Company (GPC) submitted the required response to GL 92-01, Revision 1, for Edwin I. Hatch Nuclear Plant Unit 1 and Unit 2. By letter dated May 27, 1993, the NRC requested GPC to provide additional information relative to the July 2, 1992, submittal. By letter dated July 27, 1993, GPC provided the response requested by the NRC's July 2, 1992 letter.

The NRC notified GPC, by letter dated June 3, 1994, of one remaining open issue for Hatch Unit 1 and Unit 2 regarding GL 92-01, Revision 1. Specifically, the NRC stated that the initial RT_{NDT} values determined by General Electric (GE) initial methodology have not been validated and the BWR Owners Group (BWROG) topical report, GE-NE-523-109-0893, titled "Basis for GE RT_{NDT} Estimation Method," did not resolve the issue. As a result, the NRC requested GPC to commit to the BWROG effort to resolve this issue or to provide a schedule for a plant-specific analysis to resolve this issue. Accordingly, GPC hereby commits to the BWROG's resolution of this issue for Hatch Unit 1 and Unit 2.

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The NRC's letter also requested that GPC provide confirmation of the plant-specific applicability of the topical report, NEDO-32205, Revision 1, titled "10 CFR 50 Appendix G Equivalent Margin Analysis for Low Upper Shelf Energy in BWR/2 through BWR/6 Vessels," as specified in Appendix B of that report, and submit a request for approval of the topical report as the basis for demonstrating compliance with 10 CFR 50, Appendix G, Paragraph IV.A.1, for Hatch Unit 1. Although sufficient information applicable to Hatch Unit 2 is available to demonstrate compliance with 10 CFR 50, Appendix G, Paragraph IV.A.1, GPC hereby requests approval of NEDO-32205, Revision 1, as the basis for demonstrating compliance with 10 CFR 50, Appendix G, Paragraph IV.A.1, for both Hatch Unit 1 and Unit 2. As requested by the NRC, Attachment 1 provides the plant-specific applicability forms from Appendix B of NEDO-32205, Revision 1, for Hatch Unit 1 and Unit 2.

Additionally, the NRC requested GPC to verify that the information contained in Enclosures 1 and 2 of its June 3, 1994, letter was accurately entered in the Reactor Vessel Integrity Database (RVID) for Hatch Unit 1 and Unit 2. Accordingly, Attachment 2 contains a marked-up copy of Enclosures 1 and 2 of the NRC's letter with GPC's corrections to the RVID along with the basis for each change. As stated in GPC's response to GL 92-01, Revision 1, dated July 2, 1992, GPC is a member of the Combustion Engineering Reactor Vessel Group and expects to obtain additional information to augment the chemical and physical properties of the Hatch Unit 1 and Unit 2 reactor vessels.

Mr. J. T. Beckham, Jr. states that he is Vice-President - Plant Hatch and is authorized to execute this oath on behalf of Georgia Power Company, and to the best of his knowledge and belief, the facts set forth in this letter are true.

Georgia Power Company

BY: J. T. Beckham, Jr.

Sworn to and subscribed before me this 1st day of July, 1994.

Notary Public

MY COMMISSION EXPIRES NOVEMBER 3, 1997

HL-4636

JTB/TWS:ts
Attachments

cc: Georgia Power Company
Mr. H. L. Sumner, Jr., General Manager - Plant Hatch
NORMS

U. S. Nuclear Regulatory Commission, Washington, DC
Mr. K. N. Jabbour, Licensing Project Manager - Hatch

U. S. Nuclear Regulatory Commission, Region II
Mr. S. D. Ebneter, Regional Administrator
Mr. B. L. Holbrook, Senior Resident Inspector - Hatch

State of Georgia
Mr. J. D. Tanner, Commissioner - Department of Natural Resources

ATTACHMENT 1

EQUIVALENT MARGINS ANALYSIS
PLANT APPLICABILITY VERIFICATION FORMS

FOR

EDWIN I. HATCH NUCLEAR PLANT
UNIT 1 AND UNIT 2

EQUIVALENT MARGIN ANALYSIS
PLANT APPLICABILITY VERIFICATION FORM

FOR Hatch - Unit 1

BWR/3-6 PLATE

Surveillance Plate USE:

%Cu = 0.12

Capsule Fluence = 2.4×10^{17} n/cm^2

Measured % Decrease = 6 (Charpy Curves)

R.G. 1.99 Predicted % Decrease = 8.5 (R.G. 1.99, Figure 2)

Limiting Beltline Plate USE:

%Cu = 0.17

32 EFPY Fluence = 1.8×10^{18} n/cm^2

R.G. 1.99 Predicted % Decrease = 18% (R.G. 1.99, Figure 2)

Adjusted % Decrease = N/A (R.G. 1.99, Position 2.2)

18% ≤ 21%, so vessel plates are bounded by equivalent margin analysis

EQUIVALENT MARGIN ANALYSIS
PLANT APPLICABILITY VERIFICATION FORM

FOR Hatch - Unit 1

BWR/2-6 WELD

Surveillance Weld USE:

%Cu = 0.28

Capsule Fluence = 2.4×10^{17} n/cm^2

Measured % Decrease = UNKNOWN (Charpy Curves)

R.G. 1.99 Predicted % Decrease = 18 (R.G. 1.99, Figure 2)

Limiting Beltline Weld USE:

%Cu = 0.28

32 EFPY Fluence = 1.8×10^{18} n/cm^2

R.G. 1.99 Predicted % Decrease = 28% (R.G. 1.99, Figure 2)

Adjusted % Decrease = N/A (R.G. 1.99, Position 2.2)

28% $\leq$ 34%, so vessel welds are bounded by equivalent margin analysis

EQUIVALENT MARGIN ANALYSIS
PLANT APPLICABILITY VERIFICATION FORM

FOR Hatch - Unit 2

BWR/3-6 PLATE

Surveillance Plate USE:

%Cu = 0.08

Capsule Fluence = 2.3×10^{17} n/cm^2

Measured % Decrease = 0 (Charpy Curves)

R.G. 1.99 Predicted % Decrease = 7 (R.G. 1.99, Figure 2)

Limiting Beltline Plate USE:

%Cu = 0.11

32 EFPY Fluence = 1.0×10^{18} n/cm^2

R.G. 1.99 Predicted % Decrease = 12% (R.G. 1.99, Figure 2)

Adjusted % Decrease = N/A (R.G. 1.99, Position 2.2)

12 % $\leq$ 21%, so vessel plates are bounded by equivalent margin analysis

EQUIVALENT MARGIN ANALYSIS
PLANT APPLICABILITY VERIFICATION FORM
FOR Hatch - Unit 2

BWR/2-6 WELD

Surveillance Weld USE:

%Cu = 0.13

Capsule Fluence = 2.3×10^{17} n/cm^2

Measured % Decrease = 1 (Charpy Curves)

R.G. 1.99 Predicted % Decrease = 11 (R.G. 1.99, Figure 2)

Limiting Beltline Weld USE:

%Cu = 0.23

32 EFPY Fluence = 1.0×10^{18} n/cm^2

R.G. 1.99 Predicted % Decrease = 22% (R.G. 1.99, Figure 2)

Adjusted % Decrease = N/A (R.G. 1.99, Position 2.2)

22 % $\leq$ 34%, so vessel welds are bounded by equivalent margin analysis

ATTACHMENT 2

MARKED-UP COPIES OF REACTOR VESSEL
INTEGRITY DATABASE INFORMATION

FOR

EDWIN I. HATCH NUCLEAR PLANT
UNIT 1 AND UNIT 2

Summary File for Pressure-Temperature Limits

Plant Name	Beltline Ident.	Heat No. Ident.	ID Heat. Fluence at EOL	IRT_{NDT}	Method of Determin. IRT_{NDT}	Chemistry Factor	Method of Determin. CF	%Cu	%Ni
Hatch 1 EOL: 8/6/2014	Lower Int. Shell G-4803-7	C4337-1	~~1.8E18~~ 2.5E18 (2)	10°F	Plant specific	127.5	Table	0.17	0.62
	Lower Int. Shell G-4804-1	C3985-2	~~1.8E18~~ 2.5E18 (2)	10°F	Plant specific	90.4	Table	0.13	0.58
	Lower Int. Shell G-4804-2	C4114-2	~~1.8E18~~ 2.5E18 (2)	10°F	Plant specific	93.5	Table	0.13	0.70
	Lower Shell G-4805-1	C4112-1	~~1.8E18~~ 2.5E18 (2)	10°F	Plant specific	92	Table	0.13	0.64
	Lower Shell G-4805-2	C4112-2	~~1.8E18~~ 2.5E18 (2)	10°F	Plant specific	92	Table	0.13	0.64
	Lower Shell G-4805-3	~~C4149-3~~ C4149-1 (1)	~~1.8E18~~ 2.5E18 (2)	10°F	Plant specific	98.65	Table	0.14	0.57
	Lower Int. Axial Welds 1-308G/J	IP2815	~~1.8E18~~ 2.5E18 (2)	-10°F	Plant specific	209.6	Table	~~0.27~~ 0.28 (3)	0.76
	Lower Int. Axial Welds 1-308G/J	IP2809	~~1.8E18~~ 2.5E18 (2)	-10°F	Plant specific	211.8	Table	0.28	0.76
	Lower Shell Axial Welds 1-307A/C	13253	~~1.8E18~~ 2.5E18 (2)	-10°F	Plant specific	206.4	Table	0.27	0.74
	Lower Int./ Lower Shell Circ. Weld 1-313	90099	~~1.8E18~~ 2.5E18 (2)	-10°F	Plant specific	207	Table	0.17	1.00
	Lower Int./ Lower Shell Circ. Weld 1-313	33A277	~~1.8E18~~ 2.5E18 (2)	-10°F	Plant specific	236	Table	0.23	1.00

References for Hatch 1

Fluence, IRT, and chemical composition data are from July 2, 1992, letter from J. T. Beckham, Jr. to USNRC Document Control Desk, subject: Response to NRC Generic Letter 92-01, Revision 1, Reactor Vessel Structural Integrity

Weld flux data are from November 22, 1988, letter from W. G. Hairston (GPCo) to USNRC Document Control Desk, subject: Response to Generic Letter 88-11

Summary File for Upper Shelf Energy

Plant Name	Beltline Ident.	Heat No.	Material Type	1/4T USE at EOL	1/4T Neutron Fluence at EOL	Unirrad. USE	Method of Determin. Unirrad. USE
Batch 1 EOL: 8/6/2014	Lower Int. Shell G-4803-7	C4337-1	A 5338-1	EVA	~~1.3E18~~ 1.8E18 (4)	EVA	---
	Lower Int. Shell G-4804-1	C3985-2	A 5338-1	EVA	~~1.3E18~~ 1.8E18 (4)	EVA	---
	Lower Int. Shell G-4804-2	C4114-2	A 5338-1	86	~~1.3E18~~ 1.8E18 (4)	90	65%
	Lower Shell G-4805-1	C4112-1	A 5338-1	EVA	~~1.3E18~~ 1.8E18 (4)	EVA	---
	Lower Shell G-4805-2	C4112-2	A 5338-1	EVA	~~1.3E18~~ 1.8E18 (4)	EVA	---
	Lower Shell G-4805-3	~~C4149-3~~ C4149-1 (1)	A 5338-1	EVA	~~1.3E18~~ 1.8E18 (4)	EVA	---
	Lower Int. Axial Welds 1-308G/J	IP2815	Linde 1092, SAW	EVA	~~1.3E18~~ 1.8E18 (4)	EVA	---
	Lower Int. Axial Welds 1-308G/J	IP2809	Linde 1092, SAW	EVA	~~1.3E18~~ 1.8E18 (4)	EVA	---
	Lower Shell Axial Welds 1-307A/C	13253	Linde 1092, SAW	EVA	~~1.3E18~~ 1.8E18 (4)	EVA	---
	Lower Int./ Lower Shell Circ. Weld 1-313	90099	Linde 0091, SAW	EVA	~~1.3E18~~ 1.8E18 (4)	EVA	---
	Lower Int./ Lower Shell Circ. Weld 1-313	33A277	Linde 0091, SAW	EVA	~~1.3E18~~ 1.8E18 (4)	EVA	---

Summary File for Pressure-Temperature Limits

Plant Name	Beltline Ident.	Heat No. Ident.	ID Neut. Fluence at EOL	IRT_{ndt}	Method of Determin. IRT_{ndt}	Chemistry Factor	Method of Determin. CF	%Cu	%Ni
Hatch 2 EOL: 6/13/2018	Lower Shell G6603-1	C8553-2	~~1.0E18~~ 1.4E18 (5)	-20°F	Plant specific	51	Table	0.08	0.58
	Lower Shell G6603-2	C8553-1	~~1.0E18~~ 1.4E18 (5)	24°F	Plant specific	51	Table	0.08	0.58
	Lower Shell G6603-3	C8571-1	~~1.0E18~~ 1.4E18 (5)	0°F	Plant specific	51	Table	0.08	0.53
	Lower Int. Shell G6602-1	C8554-2	~~1.0E18~~ 1.4E18 (5)	-10°F	Plant specific	51	Table	0.08	0.58
	Lower Int. Shell G6602-2	C8554-1	~~1.0E18~~ 1.4E18 (5)	-20°F	Plant specific	51	Table	0.08	0.57
	Lower Int. Shell G6601-4	C8579-2	~~1.0E18~~ 1.4E18 (5)	-4°F	Plant specific	72.8	Table	0.11	0.48
	Lower Shell Axial Welds 101-842	10137	~~1.0E18~~ 1.4E18 (5)	-50°F	Plant specific	154.5	Table	0.23	0.50
	Lower Int. Shell Axial Welds 101-834	51874	~~1.0E18~~ 1.4E18 (5)	-50°F	Plant specific	138	Table	0.18	0.50
	Lower/ Lower Int. shell Circ. Weld 301-871	4P6052	~~1.0E18~~ 1.4E18 (5)	-50°F	Plant specific	~~35.43~~ 25.5 (6)	Table	0.07	0.03

Reference for Hatch 2

Fluence, IRT, and chemical composition data are from July 2, 1992, letter from J. T. Beckham, Jr. to USNRC Document Control Desk, subject: Response to NRC Generic Letter 92-01, Revision 1, Reactor Vessel Structural Integrity

Summary File for Upper Shelf Energy

Plant Name	Beltline Ident.	Heat No.	Material Type	1/4T USE at EOL	1/4T Neutron Fluence at EOL	Unirrad. USE	Method of Determin. Unirrad. USE
Hatch 2 EOL: 6/13/2018	Lower Shell G6603-1	C8573-2	A 5338-1	86	~~6.8E17~~ 1.0E18 (11)	95	65%
	Lower Shell G6603-2	C8553-1	A 5338-1	77	~~6.8E17~~ 1.0E18 (11)	85	65%
	Lower Shell G6603-3	C8571-1	A 5338-1	64	~~6.8E17~~ 1.0E18 (11)	71	65%
	Lower Int. Shell G6602-1	C8554-2	A 5338-1	84	~~7.2E17~~ 1.0E18 (11)	93	65%
	Lower Int. Shell G6602-2	C8554-1	A 5338-1	81	~~7.2E17~~ 1.0E18 (11)	90	65%
	Lower Int. Shell G6601-4	C8579-2	A 5338-1	~~63~~ 61 (7)	~~7.2E17~~ 1.0E18 (11)	70	65%
	Lower Shell Axial Welds 101-842	10137	Linde 0091, SAW	~~87~~ 84 (8)	~~6.8E17~~ 1.0E18 (11)	108	10°F data
	Lower Int. Shell Axial Welds 101-834	51874	Linde 0091, SAW	~~74~~ 72 (9)	~~7.2E17~~ 1.0E18 (11)	89	10°F data
	Lower/ Lower Int. shell Circ. Weld 301-871	4P6052	Linde 0091, SAW	~~112~~ 111 (10)	~~7.2E17~~ 1.0E18 (11)	126	10°F data

Reference for Hatch 2

Fluence, UUSE, and chemical composition data are from July 2, 1992, letter from J. T. Beckham, Jr. to USNRC Document Control Desk, subject: Response to NRC Generic Letter 92-01, Revision 1, Reactor Vessel Structural Integrity

Weld UUSEs are at 10°F; therefore, they are actually CVN values.

Notes:

1. Per Enclosure 1, Appendix A, Table 1 to GPC's July 2, 1992, response to GL 92-01, Revision 1, the heat number for Hatch Unit 1 lower shell plate G-4805-3 should be C4149-1 instead of C4149-3 contained in the Reactor Vessel Integrity Database (RVID).

2. GPC's response to GL 92-01, Revision 1, Question 2a, dated July 2, 1992, stated that the Hatch Unit 1 EOL fluence is 1.8E18 n/cm^2. However, this value is the 1/4T EOL fluence instead of the ID fluence at EOL indicated by the RVID. Therefore, the correct value for the ID fluence at EOL for Hatch Unit 1 is 2.5E18 n/cm^2 as stated in GPC's response to GL 88-11, dated November 22, 1988.

3. As stated in Enclosure 1 GPC's of response to GL 88-11, dated November 22, 1988, the copper value for Hatch Unit 1 lower intermediate axial weld 1-308G/J, heat IP2815, is 0.28 weight percent.

4. GPC's response to GL 92-01, Revision 1, Question 2a, dated July 2, 1992, stated the Hatch Unit 1 EOL fluence is 1.8E18 n/cm^2. As stated in Note 2 above, this value is the 1/4T EOL fluence as opposed to the ID fluence at EOL.

5. GPC's response, dated July 2, 1992, to GL 92-01, Revision 1, Question 3a, stated that the Hatch Unit 2 EOL fluence is 1.0E18 n/cm^2. However, this value is the 1/4T EOL fluence instead of the ID fluence at EOL indicated by the RVID. Therefore, the correct value for the ID fluence at EOL for Hatch Unit 2 is 1.4E18 n/cm^2 as stated in Enclosure 4, Table 7-1 of GPC's letter dated July 15, 1991, titled "Request to Revise Technical Specifications: Reactor Vessel Temperature and Pressure Limits."

6. The chemistry factor for the Hatch Unit 2 lower/lower intermediate shell circumferential welds should be 25.5 instead of 35.45 indicated by the RVID. This change is consistent with the information provided in Enclosure 4, Table 7-1 of GPC's letter dated July 15, 1991, titled "Request to Revise Technical Specifications: Reactor Vessel Temperature and Pressure Limits."

7. The 1/4T USE at EOL for Hatch Unit 2 lower intermediate shell G6601-4 should be 61 ft-lb instead of 63 ft-lb indicated by the RVID. This change is consistent with the information found in Enclosure 2, Appendix C, Table 2, of GPC's response to GL 92-01, Revision 1, dated July 2, 1992.

8. The 1/4T USE at EOL for Hatch Unit 2 lower shell axial welds 101-842 should be 84 ft-lb instead of 87 ft-lb indicated by the RVID. This change is consistent with the information found in Enclosure 2, Appendix C, Table 2, of GPC's response to GL 92-01, Revision 1, dated July 2, 1992.

9. The 1/4T USE at EOL for Hatch Unit 2 lower intermediate shell axial welds 101-834 should be 72 ft-lb instead of 74 ft-lb indicated by the RVID. This change is consistent with the information found in Enclosure 2, Appendix C, Table 2, of GPC's response to GL 92-01, Revision 1, dated July 2, 1992.

10. The 1/4T USE at EOL for Hatch Unit 2 lower/lower intermediate shell circumferential weld 301-871 should be 111 ft-lb instead of 112 ft-lb indicated by the RVID. This change is consistent with the information found in Enclosure 2, Appendix C, Table 2, of GPC's response to GL 92-01, Revision 1, dated July 2, 1992.

11. This change is required due to the change to the ID neutron fluence at EOL described in Note 5 above. As stated in Enclosure 4, Table 7-1 of GPC's letter dated July 15, 1991, titled "Request to Revise Technical Specifications: Reactor Vessel Temperature and Pressure Limits," the lower shell plates in the Hatch Unit 2 vessel are 6.38 inches thick and the lower intermediate shell plates are 5.38 inches thick. By applying the methodology of Regulatory Guide 1.99, Revision 2, the ID fluence at EOL of 1.4E18 n/cm^2 results in a 1/4T EOL fluence of 9.5E17n/cm^2 for the lower shell plates and lower shell axial welds and 1.0E18 n/cm^2 for the lower intermediate shell plates, lower intermediate shell welds, and lower/lower intermediate shell circumferential weld. However, use of 1.0E18 n/cm^2 as the 1/4 T EOL fluence for all Hatch Unit 2 beltline materials provides a conservative estimate of the USE decrease as stated in Enclosure 2, Appendix C, Table 2, footnote "a", of GPC's response to GL 92-01, Revision 1, dated July 2, 1992.