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U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

Subject: Beaver Valley Power Station, Unit No. 1
Docket No. 50-334, License No. DPR-66
Response to Request for Additional Information
Related to Generic Letter 92-01, Revision 1

This letter forwards our response to a July 8, 1993, request for additional information related to Generic Letter 92-01, Revision 1, "Reactor Vessel Structural Integrity, 10 CFR 50.54(f)." There were two questions relating to Beaver Valley Unit No. 1, which requested information on the following:

1. Upper-shelf energy values for circumferential weld 11-714 and lower shell axial welds 20-714.

2. Justification for the selection of the chemical compositions for certain welds.

Enclosure 1 provides the requested information. If you have any questions regarding this submittal, please contact Mr. Steve Sovick at (412) 393-5211.

Sincerely,

J. D. Sieber

Attachment

cc: Mr. L. W. Rossbach, Sr. Resident Inspector
Mr. T. T. Martin, NRC Region I Administrator
Mr. G. E. Edison, Project Manager

A028

ENCLOSURE 1

Beaver Valley Power Station, Unit No. 1
RESPONSE TO JULY 8, 1993, REQUEST FOR ADDITIONAL INFORMATION
GENERIC LETTER 92-01, REVISION 1

[redacted]

Item 1 (Question 2a in GL 92-01)

The response to GL 92-01 indicates that the initial upper-shelf energy (USE) values for circumferential weld 11-714 and lower shell axial welds 20-714, are not known. Either provide the Charpy USE for each beltline weld or provide the Charpy USE and analysis from welds that were fabricated using the same vendor, fabrication time frame, fabrication process, and material specification to demonstrate that all beltline welds will meet the USE requirements of Appendix G, 10 CFR Part 50. If this cannot be provided, then submit an analysis which demonstrates that lower values of upper-shelf energy will provide margins of safety against fracture equivalent to those required by Appendix G of the ASME Code.

Response 1

A review of the industry database has resulted in our determining the initial USE for these welds. This additional information is based on surveillance welds of the same wire heats and flux type for other reactor vessels fabricated by the same vendor of our Unit 1 reactor vessel. Initial USE for lower shell axial welds 20-714 A&B and circumferential weld 11-714 have been added to the attached Table 8 and Table 9, respectively. The calculated USE for these welds for December 16, 1991, and at EOL have been added to the attached Table 1. The sources for this data are included on the new tables. Please replace the existing tables in our July 8, 1992, response to Generic Letter 92-01, Revision 1, with the attached. The calculated EOL Charpy USE for these materials are predicted to be above the 50 ft-lb criteria.

Item 2 (Question 2b in GL 92-01)

The response reports two sets of chemical compositions for axial welds 20-714 A&B (Table 8 and 14), three sets of chemical compositions for axial welds 19-714 A&B (Table 6, 11, and 14), and two sets of chemical compositions for the circumferential weld 11-714 (Table 7 and 9). Specify and provide justification for the selection of the chemical compositions, which will be used in future ΔRT_{ndt} and ΔUSE calculations, for these welds.

[redacted]

Response 2

Future ΔRT_{ndt} and ΔUSE calculations will use the best-estimate values for the material, which will normally be the mean of the available measured values for welds made with the same weld wire heat and flux type. This is consistent with the guidance on determining the chemistry factor contained in Regulatory Guide 1.99, Revision 2.

Please note that in our July 8, 1992, response to Generic Letter 92-01, Revision 1, Tables 2 through 12 are compilations of data from the material certifications and weld qualification tests. Table 14 references the mean values of the copper and nickel for the Beaver Valley Unit 1 beltline materials found in the WOG Database which includes the values identified in Tables 2 through 12.

Table 1

Beaver Valley Unit 1
Calculated Upper-Shelf Energy (USE) Values

Beltline Material	Initial USE (ft-lb)	12/16/91 USE (ft-lb)	1/4T EOL (c) Fluence ($\times 10^{19}$ n/cm^2)	EOL USE (ft-lb)
Intermediate Shell Plate, B6607-1	90	71.1	2.16	65.3
Intermediate Shell Plate, B6607-2	82.6	65.2	2.16	59.9
Lower Shell Plate, B7203-2	83.5	66	2.16	60.5
Lower Shell Plate, B6903-1	80.0	58.4	2.16	52
Intermediate Shell Longitudinal Weld Seam, Heat 305424	112(a)	80.6	0.49	69
Lower Shell Longitudinal Weld Seam, Heat 305414	97.5(b)	66.8	0.49	60
Intermediate to Lower Shell Circumferential Weld, Heat 90136	144(d)	86.4	2.16	74.9

(a) Based on surveillance weld.
(b) Fort Calhoun surveillance weld material.
(c) Fluence projections based on recent change in core design incorporating L_4P.
(d) St.Lucie surveillance weld material.

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Table 8

Beaver Valley Unit 1
Materials Certification Information

Component: Lower Shell Seams 20-714 A&B

Heat No.: 305414
Flux Linde 0092
Flux Lot 3947
B4 Mod.

MILL Chemical Analysis[10]

C	Mn	P	S	Si	Ni	Mo	Cu	Al	Co
0.14	1.45	0.012	0.010	0.18	0.59	0.51	0.33	--	--

Charpy Impact and Fracture Tests[10]

Temp °F	Ft-Lbs	% Shear	Mils Lat. Exp.
10	82		
10	66		
10	80		

Temp. °F	Drop Weights	NDT	RTNDT	USE
			*-56°F	** 97.5ft-lb

Post Weld Heat Treatment[10]

1125-1175°F, 40 hours, Furnace cooled.

* Estimated per NRC Regulatory Review Plan MTEB 5-2
** Fort Calhoun Station surveillance weld material per LIC-92-203R "Response to NRC Generic Letter 92-01, Revision 1: Reactor Vessel Structural Integrity."

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Table 9

Beaver Valley Unit 1
Materials Certification Information

Component: Intermediate Shell to Lower Shell Seam 11-714

Heat No.: 90136
Flux Linde 0091
Flux Lot 3998
B4

MILL Chemical Analysis[11]

C	Mn	P	S	Si	Ni	Mo	Cu	Al	Co
0.11	1.16	0.013	0.010	0.16	--	0.50	0.37	--	--

Charpy Impact and Fracture Tests[11]

Temp °F	Ft-Lbs	% Shear	Mils Lat. Exp.
10	110		
10	116		
10	107		

Temp. °F	Drop Weights	NDT	RTNDT	USE
			*-56°F	** 144 ft-lb

Post Weld Heat Treatment[11]

1125-1175°F, 40 hours, Furnace cooled.

* Estimated per NRC Regulatory Review Plan MTEB 5-2
** St. Lucie Unit 1 Surveillance weld material per WCAP 12751

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