

IES
UTILITIES INC.

John F. Franz, Jr.
Vice President, Nuclear

May 6, 1994
NG-94-1721

Mr. William T. Russell, Director
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Mail Station P1-137
Washington, DC 20555

Subject: Duane Arnold Energy Center
Docket No: 50-331
Op. License No: DPR-49
Generic Letter (GL) 92-01, Revision 1,
"Reactor Vessel Structural Integrity"
Reference: Letter, R. Pulsifer (NRC) to L. Liu (IES
Utilities Inc.), dated April 4, 1994,
Subject: Duane Arnold Energy Center -
GL 92-01, Revision 1
File: A-101b, B-11

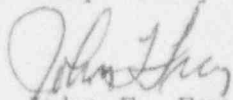
Dear Mr. Russell:

In a letter dated April 4, 1994 (Reference), your Staff requested that IES Utilities Inc. provide information pertaining to Generic Letter (GL) 92-01, Revision 1, "Reactor Vessel Structural Integrity." This information is provided in the attachments.

This letter contains no new commitments, nor does it modify any previous commitments.

Should you have any questions regarding this matter, please contact this office.

Very truly yours,



John F. Franz
Vice President, Nuclear

JFF/CJR/pjv

Attachments: 1. GL 92-01, Revision 1 Responses
2. Equivalent Margin Analysis Plant
Applicability Verification Forms

cc: C. Rushworth
L. Liu
L. Root
R. Pulsifer (NRC-NRR)
J. Martin (Region III)
NRC Resident Office
DCRC

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GL 92-01, Revision 1 Responses

NRC Request

Within 30 days, submit a commitment to the BWR Owners' Group effort or a schedule for a plant-specific analysis to resolve this issue.

IES Utilities Inc. Response

We are committed to the BWR Owners' Group effort of topical report development for NRC Staff review.

NRC Request

Provide confirmation of the plant-specific applicability of the topical report, NEDO-32205A, Revision 1.

IES Utilities Inc. Response

Confirmation of plant-specific applicability of the topical report, NEDO-32205A, Revision 1 to the Duane Arnold Energy Center (DAEC) is provided by Equivalent Margin Analysis Plant Applicability Verification for beltline plate 1-19 B0402-1 and weld filler material from the beltline area (Attachment 2). Plate 1-19 was found to be the limiting plate for the DAEC Reactor Vessel; since plate 1-19 is bounded by the equivalent margin analyses, the other three plates are bounded also. All the weld filler metal is bounded and the work sheet is typical for all other weld filler metal used in the beltline area.

NRC Request

Submit a request for approval of the topical report as the basis for demonstrating compliance with 10 CFR Part 50 Appendix G, Paragraph IV.A.1.

IES Utilities Inc. Response

IES Utilities Inc. requests approval of the topical report, NEDO-32205A, Revision 1 as the basis for demonstrating DAEC's compliance with 10 CFR Part 50, Appendix G, Paragraph IV.A.1.

NRC Request

Verify that the information provided by DAEC has been accurately entered in the NRC data base.

IES Utilities Inc. Response

All the data in the "Summary File for Pressure-Temperature Limits" and the "Summary File for Upper Shelf Energy" was reviewed.

In the "Summary File for Pressure-Temperature Limits," the title of the fourth column should be " $\frac{1}{4}$ T Neutron Fluence at EOL/EFPY" rather than "ID Neutron Fluence at EOL/EFPY". The rest of the data in the table is correct. However, it should be noted that the reported HT and Lot numbers for some of the weld filler metal are in the non-beltline area of the DAEC Reactor Vessel. The HT and Lot numbers that apply to the beltline area are:

Axial Weld - 432Z0471

Circ Weld - 07L669

The information in "Summary File for Upper Shelf Energy" requires correction as discussed below:

The $\frac{1}{4}$ T neutron fluence at EOL (column 6) was estimated to be 3.6×10^{18} n/cm² based upon testing results reported in NEDC-31166 "Duane Arnold Energy Center Reactor Pressure Vessel Surveillance Materials Testing", July 1986.

The information in Columns 5 and 7 should be corrected as follows:

Column 5	Plate 1-20:	70 ft-lbs
Column 5	Plate 1-21:	87 ft-lbs
Column 5	Weld Material Ht. 432Z0471:	86 ft-lbs
Column 7	Weld Material Ht. 432Z0471:	101 ft-lbs

EQUIVALENT MARGIN ANALYSIS
PLANT APPLICABILITY VERIFICATION FORM
FOR 1-19 B0402-1

BWR/3-6 PLATE

Surveillance Plate USE:

%Cu = 0.13

Capsule Fluence = 4.9×10^{17} n/cm² (at 5.9 EPFY)

Measured % Decrease = 2.5 (Charpy Curves)

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

Limiting Beltline Plate USE:

**%Cu = 0.13

32 EPFY Fluence = 3.6×10^{18} n/cm²

R.G. 1.99 Predicted % Decrease = 19 (R.G. 1.99, Figure 2)

Adjusted % Decrease = *NA (R.G. 1.99, Position 2.2)

19 % ≤ 21%, so vessel plates are
bounded by equivalent margin analysis

*Based upon data from one surveillance data sets. The second capsule has not been retrieved so adjusted % decrease can not be made per Section 2 of Reg. Guide 199, Rev. 2.

**Data taken from Plate 1-19, however, plate 1-20 and 1-21 have 0.15% cu but are not limiting because they have a lower RT_{NDT} value.

EQUIVALENT MARGIN ANALYSIS
PLANT APPLICABILITY VERIFICATION FORM
FOR Weld Material

BWR/2-6 WELD

Surveillance Weld USE:

%Cu = 0.03

Capsule Fluence = 4.9×10^{17} n/cm² (at 5.9 EFPY)

Measured % Decrease = 0 (Charpy Curves)

R.G. 1.99 Predicted % Decrease = 9 (R.G. 1.99, Figure 2)

Limiting Beltline Weld USE:

%Cu = 0.03

32 EFPY Fluence = 3.6×10^{18} n/cm²

R.G. 1.99 Predicted % Decrease = 14 (R.G. 1.99, Figure 2)

Adjusted % Decrease = *NA (R.G. 1.99, Position 2.2)

14 % ≤ 34%, so vessel welds are
bounded by equivalent margin analysis

*Based upon data from one surveillance data sets. The second capsule has not been retrieved so adjusted % decrease can not be made per Section 2 of Reg. Guide 199, Rev. 2.