Docket file

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

April 21, 1994

Docket Nos. 50-277, 50-278, 50-352,
and 50-353

Mr. George A. Hunger, Jr.,
Director-Licensing, MC 52A-5
PECO Energy Company
Nuclear Group Headquarters
Correspondence Control Desk
P.O. Box No. 195
Wayne, Pennsylvania 19087-0195

Dear Mr. Hunger:

SUBJECT: GENERIC LETTER 92-01, REVISION 1, "REACTOR VESSEL STRUCTURAL INTEGRITY," PEACH BOTTOM ATOMIC POWER STATION (PBAPS), UNITS 2 AND 3, AND LIMERICK GENERATING STATION (LGS), UNITS 1 AND 2 (TAC NOs. M83495, M83496, M83477, AND M83478)

By letters dated July 10, 1992, November 16, 1992, July 28, 1993, and November 29, 1993, PECO Energy Company (PECO) responded to Generic Letter (GL) 92-01, Revision 1. The GL is part of the staff's program to evaluate reactor vessel integrity for Pressurized Water Reactors (PWRs) and Boiling Water Reactors (BWRs). The information provided in response to the GL, along with previously docketed information, is being used to confirm that licensees satisfy the requirements and commitments necessary to ensure reactor vessel integrity for their facilities. The staff has determined that you have provided the information requested in the GL. However, in order to close out this issue, the staff is performing plant-specific followup efforts as discussed below.

A substantial amount of information was provided to the staff in response to the GL. This information has been entered into a data base designated as the Reactor Vessel Integrity Database (RVID). The RVID contains the following tables: A pressurized thermal shock (PTS) table for PWRs, a pressure-temperature limit table for BWRs and an upper-shelf energy (USE) table for PWRs and BWRs. Enclosure 1 provides your facilities' pressure temperature tables, Enclosure 2 provides your facilities' USE tables, and Enclosure 3 provides a key for the nomenclature used in the tables. The tables include the data necessary to perform USE, pressure-temperature limit, and RT_{PTS} evaluations. This information was taken from PECO's responses to the GL and previously docketed information. References to the specific source of the data are provided in the tables.

Regarding PBAPS, Unit 2, and LGS, Units 1 and 2, our review has identified an open issue for each plant. The initial RT_{NDT} values determined by General Electric's (GE) initial methodology have not been validated and the BWR Owners Group report, GE-NE-523-109-0893, "Basis for GE RT_{NDT} Estimation Method," did not resolve the issue. GE is in the process of validating its methodology for resolving the initial RT_{NDT} determination issue and will document the results

in a topical report. The BWR Owners Group is obtaining approval from its members to provide the GE topical report to the NRC staff for review and approval. We request that you submit, within 30 days of receipt of this letter, a commitment to the BWR Owners Group effort or a schedule for a plant-specific analysis to resolve this issue. Further, we request that you provide confirmation of the plant-specific applicability of the topical report, NEDO-32205, Revision 1, (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 Part 50, Appendix G, Paragraph IV.A.1. Additionally, we request you review the enclosures and verify that the information you have provided for your facilities has been accurately entered in our data base. If no comments are made in your response to the last request, the staff will use the information in the tables for future NRC assessments of your reactor pressure vessel.

Once you have (1) confirmed the applicability of the topical report, NEDO-32205, Revision 1, to your plants, (2) submitted the request for approval, and (3) provided your commitment to the BWR Owners Group effort or a satisfactory schedule for providing a plant-specific analysis, the staff will consider your actions (for the above plants) related to the GL to be complete. Plant-specific licensing actions will be initiated to resolve these issues.

For PBAPS, Unit 3, we request that, within 30 days of receipt of this letter, you provide confirmation of the plant-specific applicability of the topical report, NEDO-32205, Revision 1, (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 Part 50, Appendix G, Paragraph IV.A.1. This review will be a plant-specific licensing action. We further request that you review the enclosures and verify that the information you have provided for your facility has been accurately entered in our data base. If no comments are made in your response to the last request, the staff will use the information in the tables for future NRC assessments of your reactor pressure vessel. Once your confirmation of the topical report applicability and request for approval are received, the staff will consider your actions (for PBAPS, Unit 3) related to the GL to be complete.

The information requested by this letter is within the scope of the overall burden estimated in the GL. The estimated average number of burden hours is 200 person hours for each addressee's response. This estimate pertains only to the identified response-related matters and does not include the time

required to implement actions required by the regulations. This action is covered by the Office of Management and Budget Clearance Number 3150-0011, which expires June 30, 1994.

Sincerely,

Original signed by:

Frank Rinaldi, Project Manager
Project Directorate I-2
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Sincerely,

Original signed by:

Stephen Dembek, Project Manager
Project Directorate I-2
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Enclosures:
1. Pressure-Temperature Limit Tables
2. Upper-Shelf Energy Tables
3. Nomenclature Key

cc w/enclosures:
See next page

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Sincerely,

Frank Rinaldi, Project Manager
Project Directorate I-2
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Sincerely,

Stephen Dembek, Project Manager
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Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Enclosures:
1. Pressure-Temperature Limit Tables
2. Upper-Shelf Energy Tables
3. Nomenclature Key

cc w/enclosures:
See next page

Mr. George A. Hunger, Jr.
PECO Energy Company

Peach Bottom Atomic Power Station,
Units 2 and 3
Limerick Generating Station,
Units 1 and 2

cc:

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Summary File for Pressure-Temperature Limits

Plant Name	Beltline Ident.	Heat No. Ident.	ID Neut. Fluence at EOL/EFPY	IRT_{NDT}	Method of Determin. IRT_{NDT}	Chemistry Factor	Method of Determin. CF	%Cu	%Ni
Limerick 1	Shell Course #1, 14-1	C7688-1	1.73E18	10°F [1]	Plant specific	81.2	Table	0.12	0.51
EOL: 10/ 26/2024	Shell Course #1 14-2	C7698-2	1.73E18	10°F [1]	Plant specific	72.8	Table	0.11	0.48
	Shell Course #1 14-3	C7688-2	1.73E18	10°F [1]	Plant specific	81.2	Table	0.12	0.51
	Shell Course #2 17-1	C7689-1	1.73E18	10°F [1]	Plant specific	72.8	Table	0.11	0.48
	Shell Course #2 17-2	C7677-1	1.73E18	20°F [1]	Plant specific	73	Table	0.11	0.50
	Shell Course #2 17-3/	C7698-1	1.73E18	10°F [1]	Plant specific	72.8	Table	0.11	0.48
	Axial Welds	662A746	1.73E18	-20°F [1]	Plant specific	41	Table	0.03	0.88
	Ax[illegible]	1P4218	1.73E18	-50°F [1]	Plant specific	82	Table	0.06	0.89
	[illegible]	07L857/ B101A27A	1.73E18	-6°F [1]	Plant specific	41	Table	0.03	0.97
	[illegible]d	09N057/ C109A27A	1.73E18	-32°F [1]	Plant specific	41	Table	0.03	0.89
	Circ. Weld	640892/ J424B27AE	1.73E18	-60°F [1]	Plant specific	122	Table	0.09	1.00
	Circ. Weld	5P6756	1.73E18	-60°F [1]	Plant specific	108	[illegible]	0.08	0.96

Reference for Limerick 1

Plate Cu, P, Ni; IRT, and fluence data are from Table 5.3-5 of FSAR enclosed in November 11, 1992 letter (Supplemental response to GL 92-01, Rev. 1) to NRC. Weld Cu and P, and IRT data are from the same table.

[1] Additional information required to confirm value.

Summary File for Pressure-Temperature Limits

Plant Name	Beltline Ident.	Heat No. Ident.	ID Neut. Fluence at EOL/EFPY	IRT_{ndt}	Method of Determin. IRT_{ndt}	Chemistry Factor	Method of Determin. CF	%Cu	%Ni
Limerick 2	Shell Course #1 14-1	B3312-1	1.73E18	10°F [1]	Plant specific	90.4	Table	0.13	0.58
EOL: 10/ 26/2024	Shell Course #1 14-2	B3416-1	1.73E18	40°F [1]	Plant specific	101.25	Table	0.14	0.65
	Shell Course #1 14-3	C9621-2	1.73E18	22°F [1]	Plant specific	110	Table	0.15	0.60
	Shell Course #2 17-1	C9569-2	1.73E18	10°F [1]	Plant specific	73.1	Table	0.11	0.51
	Shell Course #2 17-2	C9526-1	1.73E18	10°F [1]	Plant specific	73.6	Table	0.11	0.56
	Shell Course #2 17-3	C9526-2	1.73E18	10°F [1]	Plant specific	73.6	Table	0.11	0.56
	Axial Welds	432A2671/ H019A27A	1.73E18	-12°F [1]	Plant specific	54	Table	0.04	1.08
	Axial Welds	661A746/ H013A27A	1.73E18	-20°F [1]	Plant specific	41	Table	0.03	0.88
	Circ. Weld	07L857/ B101A27A	1.73E18	-6°F [1]	Plant specific	41	Table	0.03	0.97
	Circ. Weld	09M057/ C109A27A	1.73E18	-32°F [1]	Plant specific	41	Table	0.03	0.89
	Circ. Weld	03M014/ C118A27A	1.73E18	-34°F [1]	Plant specific	20	Table	0.01	0.94
	Circ. Weld	640892/ J424B27AE	1.73E18	-60°F [1]	Plant specific	122	Table	0.09	1.00

Reference for Limerick 2

Cu, Ni, and P; fluence, and IRT data are from Table 5.3-5 of the FSAR enclosed in November 11, 1992 letter (Supplemental response to GL 92-01, Rev. 1) to NRC.

[1] Additional information required to confirm value.

Summary File for Pressure-Temperature Limits

Plant Name	Beltline Ident.	Heat No. Ident.	ID Nout. Fluence at EOL/EFPY	IRT_{ndt}	Method of Determin. IRT_{ndt}	Chemistry Factor	Method of Determin. CF	%Cu	%Ni
Peach Bottom 2 EOL: 1/31/2008	Lower Shell	C2791-2	8.0E17	-8°F [1]	Plant specific	81.4	Table	0.12	0.52
	Lower Shell	C2761-1	8.0E17	-14°F [1]	Plant specific	73.4	Table	0.11	0.54
	Lower Shell	C2873-2	8.0E17	-20°F	Plant specific	82.4	Table	0.12	0.57
	Lower Int. Shell	C2894-2	8.0E17	-20°F	Plant specific	85.6	Table	0.13	0.42
	Lower Int. Shell	C2873-1	8.0E17	-6°F [1]	Plant specific	82.4	Table	0.12	0.57
	Lower Int. Shell	C2761-2	8.0E17	-20°F	Plant specific	73.4	Table	0.11	0.54
	Axial Welds	37C065	8.0E17	-45°F	generic	109.25	Table	0.21	0.21
	Circ. Weld	S-3986	8.0E17	-32°F [1]	Plant specific	82	Table	0.06	0.97

Reference for Peach Bottom 2

Fluence, chemical composition, and IRT data are from July 10, 1992, letter from G. J. Beck (PECo) to USNRC Document Control Desk, subject: Response to Generic Letter 92-01, Revision 1, "Reactor Vessel Structural Integrity, 10 CFR 50.54(f)"

[1]Additional information required to confirm value.

Summary File for Pressure-Temperature Limits

Plant Name	Beltline Ident.	Heat No. Ident.	ID Neut. Fluence at EOL/EFPY	IRT_{NDT}	Method of Determin. IRT_{NDT}	Chemistry Factor	Method of Determin. CF	%Cu	%Ni
Peach Bottom 3 EOL: 1/31/2008	Lower Shell 6-146-1	C4689-2	7.2E17	-10°F	Plant specific	82.2	Table	0.12	0.56
	Lower Shell 6-146-3	C4684-2	7.2E17	-20°F	Plant specific	90.4	Table	0.13	0.58
	Lower Shell 6-146-7	C4627-1	7.2E17	-20°F	Plant specific	82.4	Table	0.12	0.57
	Lower Int. Shell 6-139-10	C2773-2	7.2E17	10°F	Plant specific	103.95	Table	0.15	0.49
	Lower Int. Shell 6-139-11	C2775-1	7.2E17	10°F	Plant specific	86.8	Table	0.13	0.46
	Lower Int. Shell 6-139-12	C3103-1	7.2E17	10°F	Plant specific	100	Table	0.14	0.60
	Int. Shell 6-146-5	C4608-1	7.2E17	10°F	Plant specific	82	Table	0.12	0.55
	Int. Shell 6-146-4	C4689-1	7.2E17	10°F	Plant specific	82.2	Table	0.12	0.56
	Int. Shell 6-146-2	C4654-1	7.2E17	10°F	Plant specific	73.5	Table	0.11	0.55
	Lower to Lower Int. Shell Circ. Weld (DE)	3P4000	7.2E17	-50°F	Plant specific	27	Table	0.02	0.96
	Int. to Lower Int. Shell Circ. Weld (EF)	1P4217	7.2E17	-50°F	Plant specific	147.2	Table	0.11	0.96
	Axial Welds D1/3, E1/3, F1/3	37C065	7.2E17	-45°F	generic	109.25	Table	0.21	0.21

Reference for Peach Bottom 3

Fluence, chemical composition, and IRT data are from July 10, 1992, letter from G. J. Beck (PECo) to USNRC Document Control Desk, subject: Response to Generic Letter 92-01, Revision 1, "Reactor Vessel Structural Integrity, 10 CFR 50.54(f)"

Summary File for Upper Shelf Energy

Plant Name	Beltline Ident.	Heat No.	Material Type	1/4T USE at EOL/EFPY	1/4T Neutron Fluence at EOL/EFPY	Unirrad. USE	Method of Determin. Unirrad. USE
Limerick 1 EOL: 10/26/2024	Shell Course #1, 14-1	C7688-1	A 5338-1	EMA[2]	1.2E18	EMA[2]	---
	Shell Course #1 14-2	C7698-2	A 5338-1	EMA[2]	1.2E18	EMA[2]	---
	Shell Course #1 14-3	C7698-2	A 5338-1	EMA[2]	1.2E18	EMA[2]	---
	Shell Course #2 17-1	C7689-1	A 5338-1	EMA[2]	1.2E18	EMA[2]	---
	Shell Course #2 17-2	C7677-1	A 5338-1	EMA[2]	1.2E18	EMA[2]	---
	Shell Course #2 17-3/	C7698-1	A 5338-1	EMA[2]	1.2E18	EMA[2]	---
	Axial Welds	662A746	Flux type unknown, SMAW	EMA[2]	1.2E18	EMA[2]	---
	Axial Welds	IP4218	Linde 124, SAW	EMA[2]	1.2E18	EMA[2]	---
	Circ. Weld	07L857/ B101A27A	Flux and weld type unknown	EMA[2]	1.2E18	EMA[2]	---
	Circ. Weld	09W057/ C109A27A	Flux and weld type unknown	EMA[2]	1.2E18	EMA[2]	---
	Circ. Weld	640892/ J424827AE	Flux and weld type unknown	EMA[2]	1.2E18	EMA[2]	---
	Circ. Weld	5P6756	Flux and weld type unknown	EMA[2]	1.2E18	EMA[2]	---

Reference for Limerick 1

Plate Cu, P, Ni; UUSE; and fluence data are from Table 5.3-5 of FSAR enclosed in November 11, 1992 letter to NRC (Supplemental to GL 92-01 response). Weld Cu and P, and IRT data are from the same table.

[2]Licensee must confirm applicability of Topical Report NEDO-32205, Rev. 1

Summary File for Upper Shelf Energy

Plant Name	Beltline Ident.	Heat No.	Material Type	1/4T USE at EOL/EFPY	1/4T Neutron Fluence at EOL/EFPY	Unirrad. USE	Method of Determin. Unirrad. USE
Limerick 2 EOL: 10/26/2024	Shell Course #1 14-1	83312-1	A 5338-1	EMA[2]	1.2E18	EMA[2]	---
	Shell Course #1 14-2	83416-1	A 5338-1	EMA[2]	1.2E18	EMA[2]	---
	Shell Course #1 14-3	C9621-2	A 5338-1	EMA[2]	1.2E18	EMA[2]	---
	Shell Course #2 17-1	C9569-2	A 5338-1	EMA[2]	1.2E18	EMA[2]	---
	Shell Course #2 17-2	C9526-1	A 5338-1	EMA[2]	1.2E18	EMA[2]	---
	Shell Course #2 17-3	C9526-2	A 5338-1	EMA[2]	1.2E18	EMA[2]	---
	Axial Welds	432A2671/ H019A27A	SMAW	EMA[2]	1.2E18	EMA[2]	---
	Axial Welds	661A746/ H013A27A	SMAW	EMA[2]	1.2E18	EMA[2]	---
	Circ. Weld	07L857/ B101A27A	SMAW	EMA[2]	1.2E18	EMA[2]	---
	Circ. Weld	09W057/ C109A27A	SMAW	EMA[2]	1.2E18	EMA[2]	---
	Circ. Weld	03W014/ C118A27A	SMAW	EMA[2]	1.2E18	EMA[2]	---
	Circ. Weld	640892/ J424827AE	SMAW	EMA[2]	1.2E18	EMA[2]	---

Reference for Limerick 2

Cu, Ni, and P; fluence, and UUSE data are from Table 5.3-5 of the FSAR enclosed in November 11, 1992 letter to NRC (Supplemental to GL 92-01 response).

[2]Licensee must confirm applicability of Topical Report NEDO-32205, Rev. 1

Summary File for Upper Shelf Energy

Plant Name	Beltline Ident.	Heat No.	Material Type	1/4T USE at EOL/EFPY	1/4T Neutron Fluence at EOL/EFPY	Unirrad. USE	Method of Determin. Unirrad. USE
Peach Bottom 2 EOL: 1/31/2008	Lower Shell	C2791-2	A 302B Mod.	EMA[2]	5.5E17	EMA[2]	---
	Lower Shell	C2761-1	A 302B Mod.	EMA[2]	5.5E17	EMA[2]	---
	Lower Shell	C2873-2	A 302B Mod.	EMA[2]	5.5E17	EMA[2]	---
	Lower Int. Shell	C2894-2	A 302B Mod.	EMA[2]	5.5E17	EMA[2]	---
	Lower Int. Shell	C2873-1	A 302B Mod.	EMA[2]	5.5E17	EMA[2]	---
	Lower Int. Shell	C2761-2	A 302B Mod.	74	5.5E17	82	65%
	Axial Welds	37C065	Flux type unknown, SAW	EMA[2]	5.5E17	EMA[2]	---
	Circ. Weld	S-3986	Linde 124, SAW	EMA[2]	5.5E17	EMA[2]	---

Reference for Peach Bottom 2

Fluence, chemical composition, and UUSE data are from July 10, 1992, letter from G. J. Beck (PECo) to USNRC Document Control Desk, subject: Response to Generic Letter 92-01, Revision 1, "Reactor Vessel Structural Integrity, 10 CFR 50.54(f)"

PR_EDB has no UUSE or IUSE for both the surveillance plate and weld

[2]Licensee must confirm applicability of Topical Report NEDO-32205, Rev. 1

Summary File for Upper Shelf Energy

Plant Name	Beltline Ident.	Heat No.	Material Type	1/4T USE at EOL/EFPY	1/4T Neutron Fluence at EOL/EFPY	Unirrad. USE	Method of Determin. Unirrad. USE
Peach Bottom 3 EOL: 1/31/2008	Lower Shell 6-146-1	C4689-2	A 302B Mod.	EMA[2]	5.0E17	EMA[2]	---
	Lower Shell 6-146-3	C4684-2	A 302B Mod.	EMA[2]	5.0E17	EMA[2]	---
	Lower Shell 6-146-7	C4627-1	A 302B Mod.	EMA[2]	5.0E17	EMA[2]	---
	Lower Int. Shell 6-139-10	C2773-2	A 302B Mod.	EMA[2]	5.0E17	EMA[2]	---
	Lower Int. Shell 6-139-11	C2775-1	A 302B Mod.	EMA[2]	5.0E17	EMA[2]	---
	Lower Int. Shell 6-139-12	C3103-1	A 302B Mod.	79	5.0E17	89	65%
	Int. Shell 6-146-5	C4608-1	A 302B Mod.	EMA[2]	5.0E17	EMA[2]	---
	Int. Shell 6-146-4	C4689-1	A 302B Mod.	EMA[2]	5.0E17	EMA[2]	---
	Int. Shell 6-146-[illegible]	C4654-1	A 302B Mod.	EMA[2]	5.0E17	EMA[2]	---
	Lower to Lower Int. Shell Circ. Weld (DE)	3P4000	Linde 124, SAW	88	5.0E17	97	10°F data
	Int. to Lower Int. Shell Circ. Weld (EF)	1P4217	Linde 124, SAW	62	5.0E17	71	10°F data
	Axial Welds D1/3, E1/3, F1/3	37C065	Flux unknown, SAW	82	5.0E17	99	Direct

Reference for Peach Bottom 3

Fluence, chemical composition, and UUSE data are from July 10, 1992, letter from G. J. Beck (PECo) to USNRC Document Control Desk, subject: Response to Generic Letter 92-01, Revision 1, "Reactor Vessel Structural Integrity, 10 CFR 50.54(f)"

[2]Licensee must confirm applicability of Topical Report NEDO-32205, Rev. 1

PRESSURE-TEMPERATURE LIMIT TABLES AND USE TABLES FOR ALL BWR PLANTS

NOMENCLATURE

Pressure-Temperature Limits Table

Column 1: Plant name and date of expiration of license.
Column 2: Beltline material location identification.
Column 3: Beltline material heat number; for some welds that a single-wire or tandem-wire process has been reported, (S) indicates single wire was used in the SAW process, (T) indicates tandem wire was used in the SAW process.
Column 4: End-of-life (EOL) neutron fluence at vessel inner wall; cited directly from inner diameter (ID) value or calculated by using Regulatory Guide (RG) 1.99, Revision 2 neutron fluence attenuation methodology from the quarter thickness (T/4) value reported in the latest submittal (GL 92-01, PTS, or P/T limits submittals).
Column 5: Unirradiated reference temperature.
Column 6: Method of determining unirradiated reference temperature (IRT).

Plant-Specific
This indicates that the IRT was determined from tests on material removed from the same heat of the beltline material.

MTEB 5-2
This indicates that the unirradiated reference temperature was determined from following MTEB 5-2 guidelines for cases where the IRT was not determined using American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section III, NB-2331, methodology.

Generic
This indicates that the unirradiated reference temperature was determined from the mean value of tests on material of similar types.

Column 7: Chemistry factor for irradiated reference temperature evaluation.
Column 8: Method of determining chemistry factor

Table
This indicates that the chemistry factor was determined from the chemistry factor tables in RG 1.99, Revision 2.

Calculated
This indicates that the chemistry factor was determined from surveillance data via procedures described in RG 1.99, Revision 2.

Column 9: Copper content; cited directly from licensee value except when more than one value was reported. (Staff used the average value in the latter case.)

No Data
This indicates that no copper data has been reported and the default value in RG 1.99, Revision 2, will be used by the staff.

Column 10: Nickel content; cited directly from licensee value except when more than one value was reported. (Staff used the average value in the latter case.)

No Data

This indicates that no nickel data has been reported and the default value in RG 1.99, Revision 2, will be used by the staff.

Upper Shelf Energy Table

Column 1: Plant name and date of expiration of license.
Column 2: Beltline material location identification.
Column 3: Beltline material heat number; for some welds that a single-wire or tandem-wire process has been reported, (S) indicates single wire was used in the SAW process. (T) indicates tandem wire was used in the SAW process.
Column 4: Material type; plate types include A 533B-1, A 302B, A 302B Mod., and forging A 508-2; weld types include SAW welds using Linde 80, 0091, 124, 1092, ARCOS-B5 flux, Rotterdam welds using Graw Lo, SMIT 89, LW 320, and SAF 89 flux, and SMAW welds using no flux.
Column 5: EOL upper-shelf energy (USE) at T/4; calculated by using the EOL fluence and either the cooper value or the surveillance data. (Both methods are described in RG 1.99, Revision 2.)

EMA
This indicates that the USE issue may be covered by the approved equivalent margins analysis in the BWR Owners Group Topical Report: NEDO-32205, Revision 1.

Column 6: EOL neutron fluence at T/4 from vessel inner wall; cited directly from T/4 value or calculated by using RG 1.99, Revision 2 neutron fluence attenuation methodology from the ID value reported in the latest submittal (GL 92-01, PTS, or P/T limits submittals).

Column 7: Unirradiated USE.

EMA
This indicates that the USE issue may be covered by the approved equivalent margins analysis in the BWR Owners Group Topical Report: NEDO-32205, Revision 1.

Column 8: Method of determining unirradiated USE

Direct
For plates, this indicates that the unirradiated USE was from a transverse specimen. For welds, this indicates that the unirradiated USE was from test date.

65%
This indicates that the unirradiated USE was 65% of the USE from a longitudinal specimen.

Generic
This indicates that the unirradiated USE was reported by the licensee from other plants with similar materials to the beltline material.

NRC generic
This indicates that the unirradiated USE was derived by the staff from other plants with similar materials to the beltline material.

10, 30, 40, or 50 °F
This indicates that the unirradiated USE was derived from Charpy test conducted at 10, 30, 40, or 50 °F.

Surv. Weld
This indicates that the unirradiated USE was from the surveillance weld having the same weld wire heat number.

Equiv. to Surv. Weld
This indicates that the unirradiated USE was from the surveillance weld having different weld wire heat number.

Sister Plant
This indicates that the unirradiated USE was derived by using the reported value from other plants with the same weld wire heat number.

Blank
indicates that there is insufficient data to determine the unirradiated USE. These licensees will utilize Topical Report NEDO-32205, Revision 1 to demonstrate USE compliance to Appendix G, 10 CFR Part 50.