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

May 4, 1994

Docket No. 50-382

Mr. Ross P. Barkhurst
Vice President Operations
Entergy Operations, Inc.
Post Office Box B
Killona, Louisiana 70066

Dear Mr. Barkhurst:

SUBJECT: GENERIC LETTER (GL) 92-01, REVISION 1, "REACTOR VESSEL STRUCTURAL INTEGRITY," ENTERGY OPERATIONS, INC., WATERFORD STEAM ELECTRIC STATION, UNIT 3 (TAC NO. M83524)

By letters dated July 6, 1992, and November 8, 1993, Entergy Operations, Inc., provided its response to GL 92-01, Revision 1. The NRC staff has completed its review of your responses. Based on its review, the staff has determined that Entergy Operations, Inc., has provided the information requested in GL 92-01.

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 GL 92-01, including previously docketed information, is being used to confirm that licensees satisfy the requirements and commitments necessary to ensure reactor vessel integrity for their facilities.

A substantial amount of information was provided in response to GL 92-01, Revision 1. These data have been entered into a computerized data base designated 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 the PTS table, Enclosure 2 provides the USE table for your facility, and Enclosure 3 provides a key for the nomenclature used in the tables. The tables include the data necessary to perform USE and RT_{pts} evaluations. These data were taken from your responses to GL 92-01 and previously docketed information. References to the specific source of the data are provided in the tables.

We request that you verify that the information you have provided for your facility has been accurately entered in the summary data file. No response is necessary unless an inconsistency is identified. If no comments are received within 30 days of the date of this letter, the staff will consider your actions related to GL 92-01, Revision 1, to be complete and will use the information in the tables for future NRC assessments of your reactor pressure vessel.

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The information requested by this letter is within the scope of the overall burden estimated in GL 92-01, Revision 1, "Reactor Vessel Structural Integrity, 10 CFR 50.54(f)." 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:

David L. Wigginton, Senior Project Manager
Project Directorate IV-1
Division of Reactor Projects - III/IV
Office of Nuclear Reactor Regulation

Enclosures:
1. Pressurized Thermal Shock Table
2. Upper-Shelf Energy Table
3. Nomenclature Key

cc w/enclosures:
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Docket File	NRC & Local PDRs	PD4-1 Reading
D. Wigginton	E. Adensam	W. Beckner
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J. Roe	A. B. Beach, RIV	D. McDonald
S. Sheng		

OFC	LA:PD4-1	PM:PD4-1	D:PD4-1
NAME	PNoonan	DWigginton:pk	WBeckner
DATE	5/4/94	5/4/94	5/4/94
COPY	YES/NO	YES/NO	YES/NO

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Sincerely,

DLWigginton

David L. Wigginton, Senior Project Manager
Project Directorate IV-1
Division of Reactor Projects - III/IV
Office of Nuclear Reactor Regulation

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See next page

Mr. Ross P. Barkhurst
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Waterford 3

cc:

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Baton Rouge, Louisiana 70825-1697

Summary File for Pressurized Thermal Shock

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
Waterford 3 EOL: 12/18/ 2024	Int. Shell M-1003-1	56488-1	3.68E19	-30°F	MTEB 5-2	20	Table	0.02	0.71
	Int. Shell M-1003-2	56512-1	3.68E19	-50°F	MTEB 5-2	20	Table	0.02	0.67
	Int. Shell M-1003-3	56484-1	3.68E19	-42°F	MTEB 5-2	20	Table	0.02	0.70
	Lower Shell M-1004-1	57326-1	3.68E19	-15°F	MTEB 5-2	20	Table	0.03	0.62
	Lower Shell M-1004-2	57286-1	3.68E19	22°F	MTEB 5-2	20	Table	0.03	0.58
	Lower Shell M-1004-3	57359-1	3.68E19	-10°F	MTEB 5-2	20	Table	0.03	0.62
	Lower Shell Axial Welds 101-142A/C	83653	3.68E19	-80°F	Plant Specific	35	Table	0.03	0.20
	Int. Shell Axial Welds 101-124A/C	BOLA, HODA	3.68E19	-60°F	Plant Specific	27	Table	0.02	0.96
	Int./Lower Shell Circ. Weld 101-171	88114	3.68E19	-70°F	Plant Specific	44.4	Table	0.05	0.16

<u>Reference</u>

Chemical composition and IRT_{ndt} data are from July 6, 1992, letter from R. F. Burski (EO) to USNRC Document Control Desk, subject: Waterford 3 SES, Generic Letter 92-01, Revision 1, Response

Fluence data is from from BAW-2177 (November 1992).

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
Waterford 3 EOL: 12/18/2024	Int. Shell M-1003-1	56488-1	A 533B-1	72	2.193E19	94	65%
	Int. Shell M-1003-2	56512-1	A 533B-1	75	2.193E19	97	65%
	Int. Shell M-1003-3	56484-1	A 533B-1	69	2.193E19	90	65%
	Lower Shell M-1004-1	57326-1	A 533B-1	88	2.193E19	106	65%
	Lower Shell M-1004-2	57286-1	A 533B-1	72	2.193E19	94	65%
	Lower Shell M-1004-3	57359-1	A 533B-1	73	2.193E19	94	65%
	Lower Shell Axial Welds 101-142A/C	83653	Linde 0091, SAW	99	2.193E19	129	Direct
	Int. Shell Axial Welds 101-124A/C	BOLA, HODA	E8018, SMAW	82	2.193E19	106	Direct
	Int./Lower Shell Circ. Weld 101-171	88114	Linde 0091, SAW	128	2.193E19	166	Direct

References

Weld UUSEs are from November 8, 1993 letter to NRC (Response to GL 92-01 RAI).

Plate material type and UUSEs are from Table A1 of BAW-2177 (November, 1992).

Chemical composition and fluence data are from July 6, 1992, letter from R. F. Burski (EO) to USNRC Document Control Desk, subject: Waterford 3 SES, Generic Letter 92-01, Revision 1, Response

PRESSURIZED THERMAL SHOCK TABLES AND USE TABLES FOR ALL PWR PLANTS

NOMENCLATURE

Pressurized Thermal Shock 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 a topical report.

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.

<u>EMA</u>
This indicates that the USE issue may be covered by the approved equivalent margins analysis in a topical report.

Column 8: Method of determining unirradiated USE.

<u>Direct</u>
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.

<u>65%</u>
This indicates that the unirradiated USE was 65% of the USE from a longitudinal specimen.

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

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

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

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

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

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

<u>Blank</u>
Indicates that there is insufficient data to determine the unirradiated USE.