



UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D. C. 20555-0001

April 12, 1994

Docket No. 50-341

Mr. Douglas R. Gipson
Senior Vice President
Nuclear Generation
Detroit Edison Company
6400 North Dixie Highway
Newport, Michigan 48166

Dear Mr. Gipson:

SUBJECT: GENERIC LETTER (GL) 92-01, REVISION 1, "REACTOR VESSEL STRUCTURAL INTEGRITY," - FERMI-2 (TAC NO. M83463)

By letters dated June 30, 1992, and September 22, 1993, Detroit Edison Company 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 Detroit Edison Company has provided the information requested in GL 92-01 for Fermi-2.

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. This data has been entered into a computerized database 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 pressure-temperature 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, pressure-temperature limit, and RT_{pts} evaluations. This data was taken from your responses to GL 92-01 and previously docketed information. The information in the RVID for your facility will be considered accurate at this point in time and will be used in the staff's assessments related to vessel structural integrity. References to the specific source of the data are provided in the tables.

As a result of our GL 92-01 review, the NRC staff has identified one open issue for your plant. The initial RT_{NDT} values determined by General Electric's (GE) initial methodology have not been validated and the BWR Owners Group topical report, GE-NE-523-109-0893, entitled, "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

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obtaining approval from its members to provide the GE topical report to the NRC staff for its review and approval. We request that you submit within 30 days, 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 verify that the information you have provided for your facility has been accurately entered in the data base. If no comments are made in your response to the second request, the staff will use the information in the tables for future NRC assessments of your reactor pressure vessel. Once your commitment to the BWR Owners Group effort is received or your schedule for providing a plant-specific analysis is considered satisfactory, the staff will consider your actions related to GL 92-01, Revision 1, to be complete. A plant-specific licensing action will be initiated to resolve the RT_{NDT} issue for your plant either by referencing the topical report when it is reviewed and approved or for reviewing your plant-specific analysis.

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

Timothy G. Colburn, Sr. Project Manager
 Project Directorate III-1
 Division of Reactor Projects - III/IV/V
 Office of Nuclear Reactor Regulation

Enclosures:

1. Pressure-Temperature Limit Table
2. Upper-Shelf Energy Table
3. Nomenclature Key

cc w/enclosures:
 See next page

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Mr. Douglas R. Gipson
Detroit Edison Company

Fermi-2

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Summary File for Pressure-Temperature Limits

Plant Name	Beltline Ident.	Heat No. Ident.	ID Neut. Fluence at EOL/EPY	IRT _{min}	Method of Determin. IRT _{min}	Chemistry Factor	Method of Determin. CF	%Cu	%Ni
Fermi 2 EOL: 3/20/2025	Lower Int. Shell G-3703-5	C4564-1	6.5E17	-12°F ¹	Plant specific	58	Table	0.09	0.55
	Lower Int. Shell G-3705-2	C4574-2	6.5E17	-16°F ¹	Plant specific	65	Table	0.10	0.55
	Lower Int. Shell G-3705-3	C4568-2	6.5E17	-12°F ¹	Plant specific	83.15	Table	0.12	0.61
	Lower Int. Shell G-3705-1	B8614-1	6.5E17	-20°F	Plant specific	83.15	Table	0.12	0.61
	Lower Shell G-3706-1	C4540-2	6.5E17	-10°F	Plant specific	51	Table	0.08	0.62
	Lower Shell G-3706-2	C4560-1	6.5E17	-10°F	Plant specific	73.7	Table	0.11	0.57
	Lower Shell G-3706-3	C4554-1	6.5E17	-10°F	Plant specific	82.2	Table	0.12	0.56
	Lower Shell Axial Welds 2-307A/C	13253 and 12008	6.5E17	-44°F ¹	Plant specific	223.9	Table	0.26	0.87
	Lower Int. Shell Axial Welds 15-308A/D	33A277	6.5E17	-50°F	Plant specific	188.5	Table	0.32	0.50
	Lower/Lower Int. Circ. Weld 1-313	10137	6.5E17	-50°F	Plant specific	236	Table	0.23	1.00

Reference for Fermi 2

Fluence, IRT, and chemical composition data are from June 30, 1992, letter from W. S. Orser (DE) to UNSRC Document Control Desk, subject: Detroit Edison Response to Generic Letter 92-01, Rev. 1

¹Additional information required to confirm value.

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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
Fermi 2 EOL: 3/20/2025	Lower Int. Shell G-3703-5	C4564-1	A 5338-1	68	4.5E17	74	65X
	Lower Int. Shell G-3705-2	C4574-2	A 5338-1	71	4.5E17	78	65X
	Lower Int. Shell G-3705-3	C4568-2	A 5338-1	70	4.5E17	77	65X
	Lower Int. Shell G-3705-1	B8614-1	A 5338-1	76	4.5E17	85	65X
	Lower Shell G-3706-1	C4540-2	A 5338-1	86	4.5E17	94	65X
	Lower Shell G-3706-2	C4560-1	A 5338-1	91	4.5E17	101	65X
	Lower Shell G-3706-3	C4554-1	A 5338-1	77	4.5E17	86	65X
	Lower Shell Axial Welds 2-307A/C	13253 and 12008	Linde 1092, SAW	60	4.5E17	75 ³	NRC Generic
	Lower Int. Shell Axial Welds 15-308A/D	33A277	Linde 124, SAW	65	4.5E17	88	10°F data
	Lower/ Lower Int. Circ. Weld 1-313	10137	Linde 0091, SAW	86	4.5E17	105	10°F data
Reference for Fermi 2							
Fluence, UUSE, CVW, and chemical composition data are from June 30, 1992, letter from W. S. Orser (DE) to USNRC Document Control Desk, subject: Detroit Edison Response to Generic Letter 92-01, Rev. 1							

³Generic value for welds fabricated by Combustion Engineering using Linde 1092, 0091 and 124 and Arcos B-5 fluxes (Ref: Letter from S. Bloom, NRR, to T.L. Patterson, OPPD, dated December 3, 1993)

PRESSURE-TEMPERATURE LIMIT TABLES AND USE TABLES FOR ALL BWR PLANTSNOMENCLATURE KEY

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.

NOMENCLATURE KEY--continued

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 copper 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).

NOMENCLATURE KEY--continued

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.