



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

April 6, 1994

Docket No. 50-440

Mr. Robert A. Stratman  
Vice President Nuclear - Perry  
Centerior Service Company  
P.O. Box 97, S270  
Perry, Ohio 44081

Dear Mr. Stratman:

SUBJECT: GENERIC LETTER (GL) 92-01, REVISION 1, "REACTOR VESSEL STRUCTURAL INTEGRITY," (MPA B-120) - PERRY NUCLEAR POWER PLANT UNIT 1 (TAC NO. M83947)

By letters dated July 2, 1992, and October 25, 1993, Cleveland Electric Illuminating Company (CEI) provided its responses 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 CEI 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 pressure-temperature limits 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. These data were 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.

We request that you verify the information for your facility is accurate as indicated in Enclosures 1 and 2. No response is necessary unless an inconsistency is identified. If no comments are received within 30 days from the date of this letter, the staff will consider your actions related to GL 92-01, Revision 1, to be complete.

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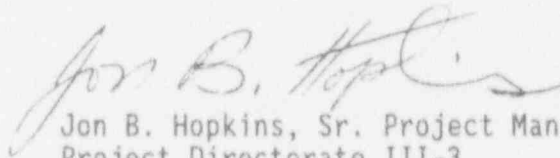
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April 6, 1994

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.

If you should have any questions regarding this review, please contact me on (301) 504-3027.

Sincerely,



Jon B. Hopkins, Sr. Project Manager  
Project Directorate III-3  
Division of Reactor Projects III/IV  
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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Sincerely,

Original Signed By:

Jon B. Hopkins, Sr. Project Manager  
Project Directorate III-3  
Division of Reactor Projects III/IV  
Office of Nuclear Reactor Regulation

Enclosures:

- 1. Pressure-Temperature Limit Table
- 2. Upper-Shelf Energy Table
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cc w/enclosures:  
See next page

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DATE	4/5/94	4/5/94	4/5/94	4/6/94

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## Summary File for Pressure-Temperature Limits

Plant Name	Beltline Ident.	Heat No. Ident.	ID Neut. Fluence at EOL/EFY	IRT <sub>max</sub>	Method of Determin. IRT <sub>max</sub>	Chemistry Factor	Method of Determin. CF	X <sub>Cu</sub>	X <sub>Ni</sub>
Perry  EOL: 3/18/2026	#2 Shell plates	C2557-1	5.4E18	10°F	Plant specific	37	Table	0.06	0.61
	#2 shell plates	B6270-1	5.4E18	-30°F	Plant specific	37	Table	0.06	0.63
	#2 shell plates	A1155-1	5.4E18	-10°F	Plant specific	37	Table	0.06	0.63
	Axial Welds	627260/ B322A27AE	5.4E18	-30°F	Plant specific	82	Table	0.06	1.08
	Axial Welds	626677/ C301A27AF	5.4E18	-20°F	Plant specific	20	Table	0.01	0.85
	Axial Welds	5P6214B/ 0331	5.4E18	-40°F	Plant specific	27	Table	0.02	0.82
	Axial Welds	624063/ D228A27A	5.4E18	-50°F	Plant specific	41	Table	0.03	1.00
	Axial Welds	627069/ C312A27A	5.4E18	-60°F	Plant specific	20	Table	0.01	0.94

References for Perry

Chemical composition and IRT are from the Perry 1 FSAR (Only #2 shell plates are in the neutron active zone)

Fluence datum is from September 14, 1990, letter from M. D. Lyster (CE) to USNRC Document Control Desk, subject: Technical Specification Change Request--Reactor Pressure-Temperature Limits

## 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
Perry  EOL: 3/18/2026	#2 Shell Plates	C2557-1	A 5338-1	64	3.74E18	84	Direct
	#2 Shell Plates	B6270-1	A 5338-1	80	3.74E18	94	Direct
	#2 Shell Plates	A1155-1	A 5338-1	99	3.74E18	114	Direct
	Axial Welds	627260/ B322A27AE	SMAW	88	3.74E18	104	Direct
	Axial Welds	626677/ C301A27AF	SMAW	77	3.74E18	90	Direct
	Axial Welds	5P62148/ 0331	Flux unknown, SAW	75	3.74E18	88	Direct
	Axial Welds	624063/ D228A27A	SMAW	89	3.74E18	105	Direct
	Axial Welds	627069/ C312A27A	SMAW	95	3.74E18	112	Direct

References for Perry

Chemical composition and UUSE are from the Perry 1 FSAR

Fluence datum is from September 14, 1990, letter from M. D. Lyster (CE) to USNRC Document Control Desk, subject: Technical Specification Change Request--Reactor Pressure-Temperature Limits

## 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 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).



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

This 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.