

Docket



UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

May 11, 1994

Docket No. 50-482

Mr. Neil S. Carns
President and Chief Executive Officer
Wolf Creek Nuclear Operating Corporation
Post Office Box 411
Burlington, Kansas 66839

Dear Mr. Carns:

SUBJECT: WOLF CREEK GENERATING STATION: GENERIC LETTER (GL) 92-01,
REVISION 1, "REACTOR VESSEL STRUCTURAL INTEGRITY"
(TAC NO. M83528)

By letter dated June 23, 1992, Wolf Creek Nuclear Operating Corporation provided its response to GL 92-01, Revision 1. The NRC staff has completed its review of your response. Based on its review, the staff has determined that Wolf Creek Nuclear Operating Corporation has provided the information requested in GL 92-01.

The GI 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 and Enclosure 2 provides the USE table for your facility. 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 response 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 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 from the date of this letter, the staff will consider your actions related to GL 92-01, Revision 1, to be complete and the staff 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

William D. Reckley, Project Manager
Project Directorate IV-2
Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

Enclosures:

- 1. Pressurized Thermal Shock Table(s)
- 2. Upper-Shelf Energy Table(s)
- 3. Nomenclature Key

cc w/enclosures:
See next page

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Summary File for Pressurized Thermal Shock

Plant Name	Beltline Ident.	Heat No. Ident.	ID Neut. Fluence at EOL	IRT _{min}	Method of Determin. IRT _{min}	Chemistry Factor	Method of Determin. CF	%Cu	%Ni
Wolf Creek	Int. shell R2005-1		2.5E19	-20°F	Plant specific	26	Table	0.04	0.66
EOL: 3/11/2025	Int. shell R2005-2		2.5E19	-20°F	Plant specific	26	Table	0.04	0.64
	Int. shell R2005-3		2.5E19	-20°F	Plant specific	31	Table	0.05	0.63
	Lower shell R2508-1		2.5E19	0°F	Plant specific	58	Table	0.09	0.67
	Lower shell R2508-2		2.5E19	10°F	Plant specific	37	Table	0.06	0.64
	Lower shell R2508-3		2.5E19	40°F	Plant specific	34.433	Calculated	0.07	0.62
	Int. and lower shell axial welds G2.06	90146	2.5E19	-50°F	Plant specific	27.8	Table	0.04	0.04
	Int. to lower shell circ. weld E3.16	90146	2.5E19	-50°F	Plant specific	41.022	Calculated	0.05	0.05

References

The copper and nickel contents and IRT_{min}s of the beltline materials are from Table B-1 of WCAP-13365. Phosphorus and sulfur contents of surveillance materials are from WCAP-13365.

The fluence is from Table 6-14 of WCAP-13365.

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
Wolf Creek EOL: 3/11/2025	Int. shell R2005-1		A 533B-1	102	1.36E19	127	Direct
	Int. shell R2005-2		A 533B-1	102	1.36E19	127	Direct
	Int. shell R2005-3		A 533B-1	108	1.36E19	135	Direct
	Lower shell R2508-1		A 533B-1	70	1.36E19	87	Direct
	Lower shell R2508-2		A 533B-1	80	1.36E19	100	Direct
	Lower shell R2508-3		A 533B-1	71	1.36E19	86	Direct
	Int. and lower shell axial welds G2.06	B4 90146	Linde 0091 SAW	120	1.36E19	150	Direct
	Int. to lower shell circ. weld E3.16	B4 90146	Linde 124, SAW	87	1.36E19	98	Surv. Weld
<u>References</u>							
The copper and nickel contents and IRT _{tot} s of the beltline materials are from Table B-1 of WCAP-13365. Phosphorus and sulfur contents of surveillance materials are from WCAP-13365.							
The fluence is from Table 6-14 of WCAP-13365.							
Material type for plates and USE data are from Table A-3 of WCAP-11553; material types for welds are from Table A-5 of WCAP-10015.							

Enclosure 3

Nomenclature and Tables

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 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 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.

EMA

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.

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.