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

April 7, 1994

Docket No. 50-461

Clinton Power Station
ATTN: Mr. Richard F. Phares
Director - Licensing
Post Office Box 678
Mail Code V920
Clinton, Illinois 61727

Dear Mr. Phares:

SUBJECT: CLINTON POWER STATION, UNIT 1 - GENERIC LETTER (GL) 92-01, REVISION 1, "REACTOR VESSEL STRUCTURAL INTEGRITY" (TAC NO. M83450)

By letter dated July 2, 1992 (U-602001), Illinois Power Company 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 Illinois Power Company 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 response 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.

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) 504-1324.

Sincerely,

ORIGINAL SIGNED BY

Douglas V. Pickett, Senior 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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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
Clinton EOL: 9/29/2026	Shell Course 2	C4363-2	6.9E18	-30°F	Plant specific	37	Table	0.06	0.62
	Shell Course 2	C4380-2	6.9E18	-20°F	Plant specific	44	Table	0.07	0.63
	Shell Course 2	C4320-2	6.9E18	-20°F	Plant specific	31	Table	0.05	0.64
	Shell Course 1	A2758-1	6.5E17	-10°F	Plant specific	65.4	Table	0.10	0.64
	Shell Course 1	A2740-1	6.5E17	-30°F	Plant specific	74.9	Table	0.11	0.66
	Welds	3P4955/ 0951(S)	6.9E18	-50°F	Plant specific	41	Table	0.03	0.93
	Welds	3P4955/ 0951(T)	6.9E18	-60°F	Plant specific	41	Table	0.03	0.89
	Welds	3P4955/ 0342(S)	6.9E18	-20°F	Plant specific	27	Table	0.02	0.95
	Welds	3P4955/ 0342(T)	6.9E18	-20°F	Plant specific	41	Table	0.03	0.90
	Welds	3P4955/ 3478(S)	6.9E18	-60°F	Plant specific	27	Table	0.02	0.97
	Welds	3P4955/ 3478(T)	6.9E18	-60°F	Plant specific	41	Table	0.03	0.90
	Welds	5P6756	6.9E18	-60°F	Plant specific	108	Table	0.08	0.96
	Welds	76492	6.9E18	-30°F	Plant specific	135	Table	0.10	1.08

References for Clinton

Beltline radius is unsubstantiated datum from Clinton Project Manager.

Beltline thickness, fluence, Ni for plates A2758-1 and A2740-1 are from July 25, 1990, letter from J. B. Hickman (USNRC) to J. C. Tsao (USNRC), subject: Request for Additional Information on Clinton Response to Generic Letter 88-11

All other data are from Clinton USAR.

NOTE: There are only five beltline plates

NOTE: There is no differentiation between axial and circumferential welds, so they are all considered both axial and circumferential welds

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
Clinton EOL: 9/29/2026	Shell Course 2	C4363-2	A 5338-1	88	4.93E18	105	Direct
	Shell Course 2	C4380-2	A 5338-1	86	4.93E18	102	Direct
	Shell Course 2	C4320-2	A 5338-1	78	4.93E18	93	Direct
	Shell Course 1	A2758-1	A 5338-1	56	4.65E17 [1]	67	50°F data
	Shell Course 1	A2740-1	A 5338-1	60	4.65E17 [1]	72	30°F data
	Welds	3P4955/ 0951(S)	Flux type unknown, SAW	78	4.93E18	93	Direct
	Welds	3P4955/ 0951(T)	Flux type unknown, SAW	67	4.93E18	80	Direct
	Welds	3P4955/ 0342(S)	Flux type unknown, SAW	76	4.93E18	90	Direct
	Welds	3P4955/ 0342(T)	Flux type unknown, SAW	80	4.93E18	95	Direct
	Welds	3P4955/ 3478(S)	Flux type unknown, SAW	93	4.93E18	111	Direct
	Welds	3P4955/ 3478(T)	Flux type unknown, SAW	87	4.93E18	104	Direct
	Welds	5P6756	Flux type unknown, flux core	103	4.93E18	126	Direct
	Welds	76492	Flux type unknown, SAW	77	4.93E18	97	Direct

References for Clinton

Fluence is from July 25, 1990, letter from J. B. Hickman (USNRC) to J. C. Tsao (USNRC), subject: Request for Additional Information on Clinton Response to Generic Letter 88-11

All other data are from Clinton USAR.

NOTE: There are only five beltline plates

[1] Additional information required to confirm value.

ENCLOSURE 3

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
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.