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

April 8, 1994

Docket No. 50-155

Mr. Patrick M. Donnelly, Plant Manager
Big Rock Point Plant
Consumers Power Company
10269 U.S. 31 North
Charlevoix, Michigan 49201

Dear Mr. Donnelly:

SUBJECT: GENERIC LETTER (GL) 92-01, REVISION 1, "REACTOR VESSEL STRUCTURAL INTEGRITY," - BIG ROCK POINT PLANT (TAC NO. M83435)

By letters dated July 1, 1992, February 25, 1993, and October 4, 1993, Consumers Power Company (CPCo) 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 CPCo has provided the information requested in GL 92-01 for Big Rock Point.

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 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. 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.

As a result of our GL 92-01 review, the staff has identified one open issue for your plant. The end-of-life (EOL) USE of the circumferential weld cannot be determined because the heat number of the weld wire used for fabricating that weld cannot be traced and the surveillance weld is only representative of the axial welds. In your letter of October 4, 1993, you stated that you would perform an equivalent margins analysis to resolve the issue of uncertain EOL USE for the circumferential weld. Within 30 days, provide a schedule for submitting this analysis. Further, we request that you verify that the

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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 response is received and your schedule is determined to be satisfactory, the staff will consider your actions related to GL 92-01, Revision 1, to be complete. The submittal of the equivalent margins analysis for the circumferential weld will be reviewed as a plant-specific licensing action.

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

Leonard N. Olshan, Project Manager
Project Directorate III-1
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
Big Rock Point	No location identification S-5503-1	19246-1	5.011E19	30°F	Plant specific	80.712	Calculated	0.10	0.18
EOL: 5/31/2000	No location identification S-5503-2	19246-2	5.011E19	30°F	Plant specific	80.712	Calculated	0.10	0.18
	No location identification S-5503-3	19246-3	5.011E19	30°F	Plant specific	80.712	Calculated	0.10	0.18
	No location identification S-5503-4	19246-4	5.011E19	30°F	Plant specific	80.712	Calculated	0.10	0.18
	Axial Welds	No data	5.011E19	-56°F	Generic	140.68	Calculated	0.27	0.10
	Circ. Weld	No data	5.011E19	-56°F	Generic	---	---	No data	No data

References for Big Rock Point

The fluence and UUSE data are from April 27, 1993 letter to NRC (Response to GL 92-01 RAI).

Chemical composition data are from June 12, 1978 letter from W. S. Skibitsky (CPCo) to D. L. Ziemann (USNRC), subject: Big Rock Point Plant--Reactor Surveillance Program

IRT and chemical composition data are from January 10, 1990, letter from K. W. Berry (CPCo) to USNRC Document Control Desk, subject: Big Rock Point Plant Technical Specification Change Request--Reactor Temperature Limits

Plate identification is from page 3 of July 29, 1977, letter from D. A. Bixel (USNRC) to Director of Nuclear Regulation (USNRC), subject: Big Rock Point and Palisades Plants, Response to Letter Dated May 20, 1977--Reactor Vessel Surveillance

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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
Big Rock Point EOL: 5/31/2000	No location identification S-5503-1	19246-1	A 302B	57	6.088E19	82	Direct
	No location identification S-5503-2	19246-2	A 302B	57	6.088E19	82	Direct
	No location identification S-5503-3	19246-3	A 302B	57	6.088E19	82	Direct
	No location identification S-5503-4	19246-4	A 302B	57	6.088E19	82	Direct
	Axial Welds	No data	ARCOS B5 SAW	47	6.088E19	95	Surv. Weld
	Circ. Welds	No data	ARCOS B5 SAW	---	6.088E19	No data	---

References for Big Rock Point

The fluence and UUSE data are from April 27, 1993 letter to NRC (Response to GL 92-01 RAI)

Chemical composition data are from June 12, 1978 letter from W. S. Skibitsky (CPCo) to D. L. Ziemann (USNRC), subject: Big Rock Point Plant--Reactor Surveillance Program

Base metal UUSE and orientation, and weld UUSE are from C. Z. Serpan, Jr., and H. E. Watson, "Mechanical Property and Neutron Spectral Analysis of the Big Rock Point Reactor Pressure Vessel," Nuclear Engineering and Design, 11 (1970), pp. 393-415

Chemical composition and fluence data are from January 10, 1990, letter from K. W. Berry (CPCo) to USNRC Document Control Desk, subject: Big Rock Point Plant Technical Specification Change Request--Reactor Temperature Limits

Plate identification is from page 3 of July 29, 1977, letter from D. A. Bixel (USNRC) to Director of Nuclear Regulation (USNRC), subject: Big Rock Point and Palisades Plants, Response to Letter Dated May 20, 1977--Reactor Vessel Surveillance

PRESSURE-TEMPERATURE LIMIT TABLES AND USE TABLES FOR ALL BWR PLANTS

NOMENCLATURE 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 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).

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.