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WISCONSIN PUBLIC SERVICE CORPORATION
600 North Adams • P.O. Box 19002 • Green Bay, WI 54307-9002

August 21, 1995

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

Ladies/Gentlemen:

Docket 50-305
Operating License DPR-43
Kewaunee Nuclear Power Plant
Reactor Vessel Structural Integrity

The Nuclear Regulatory Commission (NRC) issued Generic Letter 92-01, Revision 1, Supplement 1, "Reactor Vessel Structural Integrity," on May 19,1995. This Supplement requires that addressees identify, collect and report any new data pertinent to analysis of structural integrity of their reactor pressure vessels (RPVs) and to assess the impact of this new data on their RPV integrity analyses relative to the requirements of Section 50.60 of Title 10 of the Code of Federal Regulations (10 CFR 50.60), 10 CFR 50.61, Appendices G and H to 10 CFR 50, (which encompass pressurized thermal shock (PTS) and upper shelf energy (USE) evaluations) and the potential impact on low temperature overpressure protection (LTOP) limits or pressure-temperature (P-T) limits.

The Generic Letter Supplement requires addressees to provide the following information within 90 days:

(1) a description of those actions taken or planned to locate all data relevant to the determination of RPV integrity, or an explanation of why the existing data base is considered complete as previously submitted.

The Supplement also requires the following information to be provided within six months:

(2) an assessment of any change in best-estimate chemistry based on consideration of all relevant data;

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(3) a determination of the need for use of the ratio procedure in accordance with the established Position 2.1 of Regulatory Guide 1.99, Revision 2, for those licensees that use surveillance data to provide a basis for the RPV integrity evaluation; and

(4) a written report providing any newly acquired data as specified above and (1) the results of any necessary revisions to the evaluation of RPV integrity in accordance with the requirements of 10 CFR 50.60, 10 CFR 50.61, Appendices G and H to 10 CFR Part 50, and any potential impact on the LTOP or P-T limits in the technical specifications or (2) a certification that previously submitted evaluations remain valid. Revised evaluations and certifications should include consideration of Position 2.1 of Regulatory Guide 1.99, Revision 2, as applicable, and any new data.

Attachment 1 to this letter provides Wisconsin Public Service Corporation's (WPSC) response to requirement (1) and expeditious responses to requirements (2), (3), and (4) for the Kewaunee Nuclear Power Plant. Updates to the these responses will be provided, as necessary (i.e., the RPV integrity analyses requires revision), after completion of the following related industry activities:

(a) The Nuclear Energy Institute (NEI) task force initiative to develop recommendations for appropriate evaluation methodologies for establishing best-estimate material properties;

(b) Nuclear Regulatory Commission acceptance of the 1992 Edition through 1993 Addenda of Section XI of the Boiler and Pressure Vessel Code by incorporation into 10 CFR 50.55a or acceptance of ASME Code Case N-514 by reference in Regulatory Guide 1.147;

(c) The ABB-Combustion Engineering Owners Group Reactor Vessel Working Group Weld Property Evaluation Project (95-041-RVWG); and

(d) The Westinghouse Owners Group Reactor Vessel Integrated Database Projects (MUHP-5083 and MUHP-5071).

Activities (c) and (d) are more fully described in Attachment 1.

Summary

Notwithstanding these related industry activities and the conclusions of Attachment 1, WPSC plans to continue working with the IP 3571 sister plant utilities, NSSS vendors, and Owners Groups. This submittal completes the 90 day and six month responses required by the generic letter supplement. If significant new information becomes available within the next four

months, WPSC will provide an updated response. If not, updates will be incorporated, as necessary, into RPV integrity analyses for Kewaunee at the next scheduled revision to the evaluations following completion of related industry activities. This approach and schedule is desirable and acceptable to WPSC, since it provides both the flexibility needed to control operating costs and it ensures plant safety as documented in the Attachment 1 to this letter and its References 9, 12, and 13.

If you have any questions or require additional information, please contact a member of my staff.

Sincerely,

Clark R. Steinhardt
Senior Vice President - Nuclear Power

CAT

Attach.

cc: US NRC Region III
US NRC Senior Resident Inspector

Subscribed and Sworn to
Before Me This 21st Day
of August 1995

Notary Public, State of Wisconsin

My Commission Expires:
June 13, 1999

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ATTACHMENT 1

Letter From C R Steinhardt (WPSC)

To

Document Control Desk (NRC)

Dated

August 21, 1995

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Background

Manufacture of the Kewaunee Nuclear Power Plant reactor pressure vessel(RPV) was started by the Babcock & Wilcox Company (B&W) under contract to Westinghouse Electric Corporation (Westinghouse). However, during fabrication a work stoppage occurred at the B&W manufacturing facility. In order to expedite completion of the Kewaunee reactor vessel, Westinghouse had the forged components shipped to a Combustion Engineering, Inc. (CE) facility, where they were welded by CE. Therefore, pertinent RPV information is available from B&W, CE, and Westinghouse for the Kewaunee Nuclear Power Plant(KNPP).

Response to Requirement (1) - Actions to locate all relevant data

Wisconsin Public Service Corporation(WPSC) has implemented activities to identify and locate all data relevant for the Kewaunee Nuclear Power Plant RPV. This program includes proactive exchange of information with other weld wire heat number IP 3571 sister plant utilities (Maine Yankee, LaSalle Unit 1, and D.C. Cook Unit 1); purchase of fabrication records from CE; participation in the ABB-Combustion Engineering Owners Group Reactor Vessel Working Group (CEOG-RVWG) Weld Property Evaluation project (95-041-RVWG); participation in the Westinghouse Owners Group (WOG) Integrated Database projects (MUHP-5083 and MUHP-5071); and proactive testing of both unirradiated and irradiated IP 3571 material. A discussion of WPSC's efforts to obtain all data relevant to RPV integrity is provided below.

Exchange of Information with Weld Wire Heat Number IP 3571 Sister Plant Utilities and Purchase of Fabrication Records from CE

In 1985, WPSC contracted CE to perform a record search and record evaluation for the Kewaunee reactor vessel beltline weld. This work confirmed that additional weld wire heat number IP 3571 surveillance capsule test welds were made for LaSalle Unit 1, Maine Yankee, and Shoreham. During this work, CE indicated that additional heat number IP 3571 test welds may have been made for Hatch. However, contact with personnel at Hatch and General Electric Company (Hatch's NSSS vendor) revealed that the Hatch surveillance weld was not made with weld wire heat IP 3571. Shoreham's surveillance weld has been tentatively identified as being made with IP 3571, but the plant was shutdown and decommissioned prior to any surveillance capsule data becoming available; a single chemical analysis (D-8698) is known to exist for this plant. D.C. Cook Unit 1 has RPV weld made with IP 3571, but this material is not included in their surveillance capsule program. Available chemistry information for LaSalle Unit 1, Maine Yankee, Shoreham and Kewaunee was identified, evaluated, and incorporated into RPV integrity analyses for Kewaunee.

To the best of our knowledge, only three operating plants have surveillance capsule programs (LaSalle Unit 1, Maine Yankee, and Kewaunee) containing specimens fabricated with the same heat of wire, flux, and lot as the Kewaunee reactor vessel girth weld material (B-4 modified weld filler wire heat number IP 3571, and Linde 1092 flux-lot number 3958). As a practice,

utilities operating these reactor vessels have shared surveillance capsule testing results over the years. In addition, representatives from these utilities have met several times over the last few years and have plans to meet in the future to share RPV data and discuss related issues. Data presented in Attachment 2 of this letter represents all chemistry data currently available to WPSC for the Kewaunee reactor vessel girth weld material. Please note that this listing contains new information generated by Westinghouse for KNPP in order to support the presentation on reactor pressure vessel issues to the NRC by WPSC on April 13, 1995; revised data for LaSalle Unit 1 provided by Commonwealth Edison Company to the NRC in Reference 11; and recently received data from Maine Yankee generated as part of a CEOG program.

ABB-Combustion Engineering Owners Group Reactor Vessel Working Group (CEOG-RVWG) Projects 95-041-RVWG (Weld Property Evaluation) and CEOG Task 826 (RPV Integrated Database)

The CEOG-RVWG is undertaking a task to further research data files and log books compiled by CE to identify any additional data relevant to reactor vessel integrity. This task is focusing on data that may be available in locations other than the plant specific RPV fabrication records which were reviewed in the recently completed CE-Reactor Vessel Group program. Likely candidate vessels include steam generators and pressurizers. The CEOG-RVWG task will compile and evaluate all available data relevant to reactor vessel integrity to determine best-estimate weld chemistry for each CE fabricated weld heat. This program is tentatively scheduled to be completed in May 1996. WPSC has been a participant in the CEOG-RVWG since its inception earlier this year.

Additionally, the CEOG-RVWG is funding ABB-CE to review and prepare suggested changes to the WOG database on reactor vessel materials specific to CEOG vessels. Tables containing plant specific chemistry data will be circulated to CEOG members for verification and verified tables will be returned to Westinghouse. In return, the WOG has offered to provide hard copy versions of the WOG database to CEOG and ABB. This task is tentatively anticipated to require 12 weeks from task initiation; the WOG will likely provide tables to the CEOG-RVWG for initial review by mid October 1995 resulting in an anticipated completion date around mid February 1996.

Westinghouse Owners Group Programs MUHP-5083 and MUHP-5071 (Integrated Data Base)

The WOG recently contracted Westinghouse to work with ATI Consulting to develop a comprehensive reactor vessel materials database. WPSC is a member of WOG and is supporting this program both financially and actively by making a WPSC staff representative available to Chair the WOG Materials Subcommittee which is responsible for creating and managing this program. The purpose of this program is to provide a central source of reactor vessel materials data for all WOG plants (WOG plans to make this data base available to EPRI for general industry use and long term maintenance); provide traceability to original source references for data in NRC RVID database; identify measured data; identify sister plants having common weld

materials; and help utilities understand and sort out differences between measured data, estimated data, and licensing data. The scope of this work includes development of software utilizing Microsoft Access, customized reports, and integration/documentation of materials properties data. The data base contains information from the following sources: RVID & GL 92-01 (Data & Information), RMATCH (Heats and Chemistries), PREP3 (Surveillance Data), Fabrication Records & Plant Information, and Additional Materials (Test Data). In an attempt to ensure accuracy of the WOG data base and share data within the industry, a pre-release version of the database has been distributed to all Reactor Vessel Working Group Owners Group Chairpersons and interested WOG members. The WOG is requesting that utilities and Owners Groups review the data contained in the data base and provide comments and participate in updating the data. The process for review and update of the WOG data base consists of the following principal steps:

1) Review of data by individual WOG utilities (60 days from initial distribution which is expected to occur in mid-to-late August, 1995),

2) Incorporate changes into data base (30 days),

3) Distribute data to all Owners Groups for their review (120 days),

4) Incorporate Owners Groups changes into the data base (30 days),

5) Distribute data to utilities to aid in the resolution of sister plant inconsistencies identified in RVID (60 days),

6) Incorporate sister plant changes into data base (30 days), and

7) Distribute revised data.

Assuming that the WOG database is initially released in August, 1995, the process outlined above results in a projected completion date of July, 1996.

Testing of IP 3571 Material

In preparation for the WPSC presentation to NRC on April 13, 1995, WPSC contracted Westinghouse to review chemical analyses information previously obtained during testing of irradiated IP 3571 weld specimens obtained from the Kewaunee surveillance capsule program. As a result of this review ,WPSC contracted Westinghouse to measure the chemical composition of additional irradiated IP 3571 weld specimens from the Kewaunee surveillance capsule program. Some of the testing results were available prior to the April 13, 1995 meeting and were presented to the NRC staff. Additional chemistry measurements from this work made available after the April 13, 1995 meeting are shown in Attachment 2 to this letter.

Attachment 2 also contains chemistry measurements recently obtained from the unirradiated IP 3571 test block which was used in fabrication of the IP 3571 weld specimens included in the Kewaunee surveillance capsule program. These chemistry measurements were generated by Westinghouse under a program to perform drop weight testing to determine the nil-ductility transition temperature (NDTT) of the unirradiated IP 3571 test material used to represent the Kewaunee limiting reactor vessel circumferential weld. The results of the drop weight testing were previously transmitted by letter dated April 28, 1995 (Reference 9).

These actions taken and in progress complete our response to Item 1 requested by the Generic Letter.

Response to Requirement (2) - Assessment to Changes in Best-Estimate Chemistry

The best-estimate chemistry based upon all current relevant data as presented in Attachment 2 indicates a copper value of 0.26 and a nickel value of 0.75. This corresponds to a chemistry factor of 204°F using Regulatory Guide 1.99 Rev. 2 and compares with the most recently docketed value for Kewaunee of 190.6°F determined from surveillance capsule data (Reference 8).

Response to Requirement (3) - Use of Ratio Procedure

On April 13, 1995, NRC staff members met in Rockville, Maryland, with representatives of Wisconsin Public Service Corporation (WPSC) to address the impact of recently available proprietary information, reviewed by the NRC staff during a recent inspection at ABB-Combustion Engineering, on the Kewaunee reactor vessel integrity evaluations. At the conclusion of the meeting, the staff requested that WPSC provide an assessment of the surveillance data relative to the entire industry data base for weld wire heat IP 3571 and the need for adjusting the surveillance data in accordance with position 2.1 of Regulatory Guide 1.99, Revision 2. This is the same action requested under requirement (3) of Generic Letter 92-01, Revision 1, Supplement 1. Attachment 3 is WPSC's response to requirement (3).

Attachment 3 evaluates three cases which demonstrate that Kewaunee will remain below the pressurized thermal shock screening criteria of 300°F through end of life.

Case 1 provides an assessment of the Kewaunee surveillance data relative to the entire industry database for weld wire heat number IP 3571 using the ratio procedure established in Position 2.1 of Regulatory Guide 1.99, Revision 2.

Case 2 provides an assessment of the Kewaunee surveillance data using conservative bounding chemistries for weld wire heat number IP 3571 and the ratio procedure established in Position 2.1 of Regulatory Guide 1.99, Revision 2.

The chemistry factor ratios established for cases 1 and 2 are based upon units in °F. However, Rankine is the absolute temperature scale. WPSC requests that the NRC Staff provide clarification on the temperature scale to be used in establishing the ratio of the chemistry factors for Position 2.1 of the Regulatory Guide.

Case 3 determines the adjusted reference temperature (ART) for Kewaunee using the mean chemistry factor established from the charpy data from Kewaunee and Maine Yankee. Charpy specimens from Kewaunee and Maine Yankee have been irradiated to the same fluence that Kewaunee will see at the end of plant life.

In all three cases, the calculated ART values remain below the PTS screening criteria.

Response to Requirement (4) - Need for Revision to Reactor Integrity Evaluations

In References 9, 12, and 13 the NRC indicates that the Kewaunee reactor vessel will not reach the PTS screening criteria in the near future. WPSC's assessment of the surveillance data relative to the entire industry database for weld wire heat number IP 3571 using the ratio procedure established in Position 2.1 of Regulatory Guide 1.99 indicates that Kewaunee will not reach the PTS screening criteria prior to end of plant life.

Current pressure-temperature (P-T) limit curves for Kewaunee are acceptable for 20 effective full power years (EFPY) as documented in Reference 12. Kewaunee is projected to reach 20 EFPY during operating cycle 23; operating cycle 23 is currently forecasted to start (tentatively) on May 21, 1998. The basis for the current P-T limit curves has been reviewed by WPSC and found to be consistent with the data and assumptions presented in Attachment 3 to this letter. Therefore, WPSC hereby certifies that the previously submitted evaluation docketed in references 15 and 16 are valid for 20 EFPY. Revised P/T limit curves including a PTS evaluation for operation beyond 20 EFPY were docketed on April 28, 1995. The reports for the P/T limit curves and supporting PTS evaluation for operating beyond 20 EFPY will be revised, as necessary, following completion of related industry activities described previously.

WPSC docketed Technical Specification Proposed Amendment 134 on August 24, 1994, for evaluation of LTOP events. This proposed amendment may require revision in the future based on application of Position 2.1 of Regulatory Guide 1.99, related industry activities, and NRC endorsement of ASME Code Case N-514.

REFERENCES

1) NRC Generic Letter 92-01, Revision 1, dated March 6, 1992

2) NRC Generic Letter 92-01, Revision 1, Supplement 1, dated May 19, 1995

3) Letter from C.R. Steinhardt (WPSC) to Document Control Desk (NRC) dated June 4, 1993

4) Letter from C.R. Steinhardt (WPSC) to Document Control Desk (NRC) dated July 2, 1992

5) Letter from C.R. Steinhardt (WPSC) to Document Control Desk (NRC) dated June 2, 1992

6) Letter from E. W. James (WPSC) to A. Schwencer (NRC) dated February 1, 1978

7) Letter from D.C. Himtz (WPSC) to G.E. Lear (NRC) dated October 10, 1986

8) Letter from C.R. Steinhardt (WPSC) to Document Control Desk (NRC) dated April 28, 1995

9) Letter from R.J. Laufer (NRC) to Wisconsin Public Service Corporation dated May 17, 1995

10) Broadcast Fax from Thomas E. Tipton (NEI) to NEI Administrative Points of Contact dated July 25, 1995

11) Letter from Gary G. Benes (Commonwealth Edison Company) to Document Control Desk (NRC) dated June 21, 1995

12) Letter from Allen G. Hansen (NRC) to C. A. Schrock (WPSC) dated October 14, 1992

13) Memorandum from J. R. Strosnider (NRC) to Ashok C. Thadani (NRC) dated May 5, 1995 regarding "Assessment of Impact of Increased Variability in Chemistry on the RT_{pts} Value of PWR Reactor Vessels"

14) SECY-94-267 dated October 28,1994 from J. M. Taylor to the Commissioners

15) Letter from C.R. Steinhardt (WPSC) to Document Control Desk (NRC) dated May 27, 1992

16) Letter from C.R. Steinhardt (WPSC) to Document Control Desk (NRC) dated July 9, 1992

17) WCAP-12819, "Analysis of Maine Yankee Reactor Vessel Second Wall Capsule Located at 253°", dated March 1991

ATTACHMENT 2

Letter From C R Steinhardt (WPSC)

To

Document Control Desk (NRC)

Dated

August 21, 1995

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RESPONSE TO GENERIC LETTER 92-01,
REVISION 1, SUPPLEMENT 1, REQUIREMENT 2

Average Weight Percent of Copper (Cu) and Nickel (Ni) for the Kewaunee Reactor Vessel Girth Weld Material (Ht. # IP 3571, Linde 1092 Flux, Lot # 3958)			
Reference	**Material Description**	**Cu wt. %**	**Ni wt. %**
A-1	Lasalle Unit 1 Surveillance Specimen 443	0.20	0.75
A-1	Lasalle Unit 1 Surveillance Specimen 44A	0.20	0.76
A-1	Lasalle Unit 1 Surveillance Specimen 45E	0.23	0.82
A-1	Lasalle Unit 1 Surveillance Specimen 444	0.22	0.75
A-1	Lasalle Unit 1 Surveillance Specimen 44M	0.22	0.73
A-1	Lasalle Unit 1 Surveillance Specimen 45K	0.21	0.80
A-1	Lasalle Unit 1 Surveillance Specimen 45M	0.21	0.80
A-1	Lasalle Unit 1 Surveillance Specimen 45D	0.22	0.80
A-1	Lasalle Unit 1 Surveillance Specimen 447	0.22	0.79
A-1	Lasalle Unit 1 Surveillance Specimen 44F	0.22	0.83
A-1	Lasalle Unit 1 Surveillance Specimen 44U	0.20	0.73
A-1	Lasalle Unit 1 Surveillance Specimen 44LD	0.20	0.74
A-1	Lasalle Unit 1 Unirrad. Surveillance Weld	0.21	0.78
A-2	Kewaunee Surveillance Capsule "V"	0.214	0.816
A-2	Kewaunee Surveillance Capsule "V"	0.434	0.800
A-4	Kewaunee Surveillance Capsule "V"	0.17	0.61
A-4	Kewaunee Surveillance Capsule "V"	0.20	0.70
A-4	Kewaunee Surveillance Capsule "V"	0.17	0.51
A-4	Kewaunee Surveillance Capsule "V"	0.19	0.67
A-4	Kewaunee Surveillance Capsule "R"	0.17	0.64
A-4	Kewaunee Surveillance Capsule "R"	0.34	0.72
A-4	Kewaunee Surveillance Capsule "R"	0.18	0.67

Average Weight Percent of Copper (Cu) and Nickel (Ni) for the Kewaunee Reactor Vessel Girth Weld Material (Ht. # IP 3571, Linde 1092 Flux, Lot # 3958)			
Reference	**Material Description**	**Cu wt. %**	**Ni wt. %**
A-2	Kewaunee Surveillance Capsule "R"	0.066	0.736
A-2	Kewaunee Surveillance Capsule "R"	0.207	0.769
A-4	Kewaunee Surveillance Capsule "P"	0.19	0.71
A-4	Kewaunee Surveillance Capsule "P"	0.15	0.54
A-4	Kewaunee Surveillance Capsule "P"	0.19	0.67
A-2	Kewaunee Surveillance Capsule "P"	0.18	0.74
A-2	Kewaunee Surveillance Capsule "P"	0.35	0.74
A-2	Kewaunee Surveillance Capsule "P"	0.19	0.73
A-2	Kewaunee Surveillance Capsule "P"	0.17	0.72
A-2	Kewaunee Unirradiated Surveillance Weld	0.20	0.77
A-4	Kewaunee Surveillance Capsule S	0.209	0.795
A-4	Kewaunee Surveillance Capsule S	0.186	0.689
A-4	Kewaunee Surveillance Capsule S	0.196	0.803
A-4	Kewaunee Surveillance Capsule S	0.223	0.871
A-3	Kewaunee Surveillance Test Block	0.22	0.73
A-3	Kewaunee Surveillance Test Block	0.43	0.78
A-3	Kewaunee Surveillance Test Block	0.24	0.74
A-3	Kewaunee Surveillance Test Block	0.22	0.80
A-3	Kewaunee Surveillance Test Block	0.23	0.79
A-2	CE Weld Qualification M 1.42 (Single Wire)	0.40	0.82
A-2	CE Weld Qualification M 1.43 (Tandem Wire)	0.37	0.75
A-2	Maine Yankee Surveillance Capsule 253°	0.432	0.745
A-2	Maine Yankee Surveillance Capsule 253°	0.356	0.728
A-5	Maine Yankee Surveillance Weld CO4-01	0.37	0.80

Average Weight Percent of Copper (Cu) and Nickel (Ni) for the Kewannee Reactor Vessel Girth Weld Material (Ht. # IP 3571, Linde 1092 Flux, Lot # 3958)			
Reference	**Material Description**	**Cu wt. %**	**Ni wt. %**
A-5	Maine Yankee Surveillance Weld CO4-02	0.35	0.76
A-5	Maine Yankee Surveillance Weld CO4-03	0.34	0.78
A-5	Maine Yankee Surveillance Weld CO4-04	0.33	0.78
A-5	Maine Yankee Surveillance Weld CO4-05	0.33	0.77
A-5	Maine Yankee Surveillance Weld CO4-07	0.31	0.78
A-5	Maine Yankee Surveillance Weld CO4-08	0.32	0.78
A-5	Maine Yankee Surveillance Weld CO4-09	0.32	0.78
A-5	Maine Yankee Surveillance Weld CO4-10	0.32	0.78
A-5	Maine Yankee Surveillance Weld CO4-11	0.30	0.76
A-5	Maine Yankee Surveillance Weld CO4-13	0.38	0.80
A-5	Maine Yankee Surveillance Weld CO4-14	0.53	0.81
A-5	Maine Yankee Surveillance Weld CO4-15	0.52	0.80
A-2	Maine Yankee Surveillance Weld	0.36	0.78
A-2	Maine Yankee Surveillance Capsule 263°	0.25	0.66
A-2	Maine Yankee Surveillance Capsule 263°	0.25	0.70
A-2	Maine Yankee Surveillance Capsule 263°	0.33	0.71
A-2	Maine Yankee Surveillance Capsule 263°	0.33	0.70
	SUM	16.67	47.10
	SIMPLE AVERAGE	0.26	0.75

References

A-1 Caine, T.A., et al., *LaSalle Unit 1 RPV Surveillance Materials Testing and Analysis, GE-NE-523-A166-1294*, DRF 137-0010-7, Revision 1, dated June 1995.

A-2 Ramirez, M.A., et al., *Evaluation of Pressurized Thermal Shock for 32 and 34 EFPY for Kewaunee*, WCAP-13257, March 1992.

A-3 Letter from Steven H. Byers (Spectrochemical Laboratories, Inc.) to Cindy Pezze (Westinghouse Electric Corporation), dated December 22, 1993.

A-4 Fax from Rick Reshel (Westinghouse Electric Corporation) to Chuck Tomes (WPSC) dated August 11, 1995.

A-5 Fax from Howard Jones (Maine Yankee) to Chuck Tomes (WPSC), dated August 10, 1995.

ATTACHMENT 3

Letter from C R Steinhardt (WPSC)

To

Document Control Desk (NRC)

Dated

August 21, 1995

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RESPONSE TO GENERIC LETTER 92-01,
REVISION 1, SUPPLEMENT 1, REQUIREMENT (3)

Draft assessment has been performed to determine the need for use of the ratio procedure in accordance with Position 2.1 of Regulatory Guide 1.99, Revision 2, for the circumferential weld metal in the Kewaunee vessel. This ratioing procedure is considered for application to the Kewaunee surveillance weld data which has been judged to be credible by the criteria in the Regulatory Guide. The new chemistry data obtained for weld wire heat no. IP 3571 have been examined and compared to the Kewaunee surveillance weld data. Adjustments to the chemistry factor were analyzed to evaluate the possible effects of this new data on the projected level of embrittlement in the Kewaunee vessel beltline circumferential weld.

Three cases are described below to demonstrate that Kewaunee will not exceed the pressurized thermal shock screening criteria, that is 300 °F, regardless of which methodology is chosen. Case 1 is a direct application of the ratioing procedure described in Regulatory Guide 1.99, Rev. 2 using a best-estimate chemistry from all chemistry measurements on weld wire heat no. IP 3571. Case 2 is a similar application of the ratioing procedure; however, a more conservative chemistry was assumed. Case 3 uses a best-estimate chemistry factor determined directly from the Kewaunee and Maine Yankee surveillance capsule results.

CASE 1

The simple average copper and nickel composition for B-4 modified weld filler, wire heat number IP 3571 and Linde 1092 flux lot number 3958 from Attachment 2 is 0.26 w/o and 0.75 w/o, respectively.

From data in Attachment 2, the Kewaunee surveillance capsule data supports a plant specific simple average copper and nickel composition of 0.22 w/o and 0.72 w/o, respectively.

The corresponding chemistry factor values from Table 1 of Reg. Guide 1.99, Rev. 2 for the group simple average and plant specific simple average copper and nickel values are 204° F and 187°F, respectively.

The ratio of the group chemistry factor (based on simple average copper and nickel values) to the plant specific chemistry factor (based on simple average copper and nickel values) is 1.09.

ΔRT_{NDT} values for the Kewaunee Plant are taken from Reference 8: Capsule V = 175°F, Capsule R = 235°F, Capsule P = 230°F and Capsule S = 250°F.

Capsule	f x 10^{19} n/cm^2 E > 1.0 MeV	FF	ΔRT_{NDT} x 1.09	FF x ΔRT_{NDT} x 1.09	$(FF)^2$
V	0.629	0.87	191	166	0.76
R	1.94	1.18	256	302	1.39
P	2.89	1.28	251	321	1.64
S	3.45	1.32	273	360	1.74
				Σ = 1149	Σ = 5.53

The chemistry factor calculated from the ratio procedure established in Position 2.1 of Reg. Guide 1.99, Rev. 2 is 1149/5.53 = 208°F.

ART = I + FF x CF + M

I = -50°F (Reference 8)

FF = 1.3229 for EOL Fluence = 3.443 x 10^{19} n/cm^2 (MeV > 1.0) (Reference 9)

CF = 208°F (above)

M = 28°F for measured data Reg. Guide 1.99, Rev. 2

ART = -50 + 1.3229 x 208 + 28

ART = 253°F

CASE 2

For additional conservatism, Case 2 assumes a higher average copper value of 0.33 w/o and a higher average nickel value of 0.77 w/o. as the best-estimate chemistry for wire heat number IP 3571 and Linde 1092 flux lot number 3958. These values are then used in ratioing the chemistry factor from the Kewaunee surveillance weld.

From data in Attachment 2, the Kewaunee surveillance capsule data supports a plant specific simple average copper and nickel composition of 0.22 w/o and 0.72 w/o, respectively.

The corresponding chemistry factor values from Table 1 of Reg. Guide 1.99, Rev. 2 for the assumed group simple average and plant simple average copper and nickel values is 230°F and 187°F, respectively.

The ratio of the group chemistry factor (based on a conservative copper and nickel value) to the plant specific chemistry factor (based on simple average copper and nickel values) is 1.23.

ΔRT_{NDT} values for the Kewaunee plant are taken from Reference 8: Capsule V = 175°F, Capsule R = 235°F, Capsule P = 230°F and Capsule S = 250°F.

Capsule	f x 10^{19} n/cm^2 E > 1.0 MeV	FF	ΔRT_{NDT} x 1.23	FF x ΔRT_{NDT} x 1.23	$(FF)^2$
V	0.629	0.87	215	187	0.76
R	1.94	1.18	289	341	1.39
P	2.89	1.28	283	362	1.64
S	3.45	1.32	308	407	1.74
				Σ = 1297	Σ = 5.53

The chemistry factor calculated from the ratio procedure in Position 2.1 of Reg. Guide 1.99, Rev. 2 assuming a conservative value for copper and nickel is 1297/5.53 = 235°F.

ART = I + FF x CF + M

I = -50°F (Reference 8)

FF = 1.3229 for EOL fluence = 3.443 x 10^{19} n/cm^2 MeV > 1.0 (Reference 9)

CF = 235°F (above)

M = 28°F for measured data - Reg. Guide 1.99, Rev. 2

ART = -50 + 1.3229 x 235 + 28

ART = 289°F

CASE 3

Mean chemistry factor based on all measured surveillance data from Kewaunee and Maine Yankee:

	Capsule	f x 10^{19} n/cm^2 E > 1.0 MeV	FF	ΔRT_{NDT}	FF x ΔRT_{NDT}	$(FF)^2$
Kewaunee	V	0.629	0.8701	175	152.27	0.76
	R	1.94	1.1811	235	277.57	1.39
	P	2.89	1.2818	230	321	1.64
	S	3.45	1.3233	250	360	1.74
Maine Yankee	W-263	0.572	0.8437	222	187.30	0.712
	W-253	1.25	1.0622	260	276.16	1.128
	A-25	1.79	1.1599	270	313.16	1.345
	A-35	6.53	1.4513	345	500.71	2.106
					Σ= 2332.81	Σ= 10.84

Therefore, the chemistry factor is 2332.81/10.84 = 215.2 °F.

ART = I + FF x CF + M

I = -50°F (Reference 8)

FF = 1.3229 for EOL fluence = 3.443 x 10^{19} n/cm^2 MeV > 1.0 (Reference 9)

CF = 215°F

M = 28°F for measured data - Reg. Guide 1.99 Rev. 2

ART = -50 + 215 x 1.322 + 28

ART = 262°F