

November 30, 1999

Mr. S. K. Gambhir  
Division Manager - Nuclear Operations  
Omaha Public Power District  
Fort Calhoun Station FC-2-4 Adm.  
Post Office Box 399  
Hwy. 75 - North of Fort Calhoun  
Fort Calhoun, NE 68023-0399

SUBJECT: CONCERNS WITH FORT CALHOON STATION BASIS FOR PREDICTION OF  
RT<sub>PTS</sub> AT EXPIRATION OF LICENSE (ABB CE REPORT, CEN-636, REVISION  
0) (TAC NO. MA1244)

Dear Mr. Gambhir:

By letter dated November 15, 1999, Omaha Public Power District (OPPD), submitted the ABB final report CEN-636, Revision 0, "Evaluation of Reactor Vessel Surveillance Data Pertinent to the Fort Calhoun Reactor Vessel Beltline Materials - Basis for Prediction of RT<sub>PTS</sub> at Expiration of License." You proposed to use the methodology contained in CEN-636, Revision 0, to calculate the RT<sub>PTS</sub> value for the limiting Fort Calhoun beltline weld. CEN-636, Revision 0, was submitted to address issues resulting from an updated fluence evaluation, submitted by OPPD in a letter dated January 30, 1998. The fluence evaluation was part of an application for amendment requesting deletion of a license term that is redundant to 10 CFR 50.61 requirements. The fluence submittal contained a plant-specific bias that was used to calculate the best-estimate fluence. The staff reviewed the fluence submittal and concluded that the plant-specific bias was unacceptable. During a telephone conference with you on November 4, 1999, the staff discussed using the unbiased fluence value. You agreed to use the unbiased fluence, submit the corrected fluence value, and formally submit CEN-636, Revision 0, for staff review.

The staff has reviewed CEN-636, Revision 0, and has fundamental concerns. These concerns were discussed with you in a telephone conference on November 22, 1999. In a subsequent telephone discussion, it was agreed that OPPD would meet with the staff on December 17, 1999, at the NRC Headquarters office. We have enclosed a specific discussion of staff concerns related to the revised ABB CE methodology in accordance with your request.

Sincerely,  
ORIGINAL SIGNED BY  
L. Raynard Wharton, Project Manager, Section 2  
Project Directorate IV & Decommissioning  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Docket No. 50-285

Enclosure: Staff Concerns

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UNITED STATES  
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

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Division Manager - Nuclear Operations  
Omaha Public Power District  
Fort Calhoun Station FC-2-4 Adm.  
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Fort Calhoun, NE 68023-0399

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Sincerely,

A handwritten signature in black ink, appearing to read "L. Raynard Wharton".

L. Raynard Wharton, Project Manager, Section 2  
Project Directorate IV & Decommissioning  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Docket No. 50-285

Enclosure: Staff Concerns

cc w/encls: See next page

**Ft. Calhoun Station, Unit 1**

**cc:**

**Winston & Strawn  
ATTN: Perry D. Robinson, Esq.  
1400 L Street, N.W.  
Washington, DC 20005-3502**

**Mr. Jack Jensen, Chairman  
Washington County Board  
of Supervisors  
Blair, Nebraska 68008**

**Mr. Wayne Walker, Resident Inspector  
U.S. Nuclear Regulatory Commission  
Post Office Box 309  
Fort Calhoun, Nebraska 68023**

**Regional Administrator, Region IV  
U.S. Nuclear Regulatory Commission  
611 Ryan Plaza Drive, Suite 1000  
Arlington, Texas 76011**

**Ms. Cheryl Rodgers, LLRW Program Manager  
Environmental Protection Section  
Nebraska Department of Health  
301 Centennial Mall, South  
P.O. Box 95007  
Lincoln, Nebraska 68509-5007**

**Mr. J. M. Solymossy  
Manager - Fort Calhoun Station  
Omaha Public Power District  
Fort Calhoun Station FC-1-1 Plant  
Post Office Box 399  
Hwy. 75 - North of Fort Calhoun  
Fort Calhoun, Nebraska 68023**

**Mr. Mark T. Frans  
Manager - Nuclear Licensing  
Omaha Public Power District  
Fort Calhoun Station FC-2-4 Adm.  
Post Office Box 399  
Hwy. 75 - North of Fort Calhoun  
Fort Calhoun, Nebraska 68023-0399**

STAFF CONCERNS WITH ABB COMBUSTION ENGINEERING REPORT  
CEN-636, REVISION 0, "EVALUATION OF REACTOR VESSEL SURVEILLANCE DATA  
PERTINENT TO THE FORT CALHOUN REACTOR VESSEL BELTLINE MATERIALS -  
BASIS FOR PREDICTION OF  $RT_{PTS}$  AT EXPIRATION OF LICENSE"

OMAHA PUBLIC POWER DISTRICT

FORT CALHOUN STATION, UNIT 1

DOCKET NO. 50-285

The limiting weld in the Fort Calhoun reactor vessel is a weld fabricated using a tandem submerged arc process with heats 12008/27204. CEN-636, Revision 0 proposes to use surveillance data from Westinghousedesigned plants with reactor pressure vessels (RPVs) fabricated by Combustion Engineering (CE) to demonstrate that the Fort Calhoun surveillance welds are credible and that the  $RT_{PTS}$  may be calculated using a reduced margin (reducing the sigma delta standard deviation by  $\frac{1}{2}$ ). Specifically, ABB CE proposed to use a chemistry factor calculated from the Regulatory Guide (RG) 1.99, Revision 2, "Radiation Embrittlement of Reactor Vessel Materials," tables and the best-estimate chemistry for tandem weld wire heats 12008/27204 with a reduced margin. ABB CE analyzed surveillance data from CE vessels that were fabricated about the same time as the Fort Calhoun vessel, and proposed the analyses as the basis for a reduced margin. The following concerns were identified during the staff review of the ABB CE report.

- There are no surveillance data points from a tandem weld with heats 12008/27204. Therefore, no definitive conclusion can be drawn regarding whether or not this combination of weld wire heats will produce credible data. In previous evaluations, the NRC has allowed licensees to use surveillance data from other plants in calculating a chemistry factor for their subject vessel. Licensees were also allowed to use a reduced margin to calculate  $RT_{PTS}$ . However, in all of these cases, the weld wire heat number for the surveillance weld was a single arc and was fabricated using the same heat of weld wire as the vessel beltline weld.
- In CEN-636, Revision 0, ABB CE analyzed the surveillance data from selected CE fabricated units in terms of scatter and "predictability." The report cites these analyses as the basis for reducing the margin term for calculating  $RT_{PTS}$  for the Fort Calhoun vessel. Data from Capsule U for two of the units were excluded without providing a rigorous statistical basis for exclusion. NRC guidance on data exclusion was discussed in a November 12, 1997, meeting with the industry and detailed in the subsequent meeting summary. The CE report concluded that the data for the two subject units are within the RG 1.99, Revision 2, scatter criterion. However, the excluded data do not meet the scatter criterion. Exclusion of data contradicts the conclusion that the data meet the RG 1.99,

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Revision 2, scatter criterion (i.e., the data will obviously "fit" and meet the scatter criterion if outliers are excluded).

- The ABB CE report stated that there is no significant effect of irradiation environment, and that the majority of the data sets would not require any adjustments for difference in irradiation temperature. Since the surveillance data from Westinghouse plants for heats 27204, 12008/12935 and 12008/20291 are irradiated at higher temperatures (533°F - 557°F) than Fort Calhoun (527°F - 538°F), a temperature correction should be included in the chemistry factor. The data presented in this report, and in the cited references do not justify the conclusion that a temperature correction is not needed.
- Two of the nine data points from surveillance welds fabricated using heats 12008 and 27204 (single arc) are not credible in accordance with the criteria in RG 1.99, Revision 2. Therefore, it is not appropriate to use this data as justification to reduce the margin term.

It should also be noted that CEN-636, Revision 0, contains differences in the Fort Calhoun surveillance data that are not currently reflected in the new Version 2 of the reactor vessel integrity database (RVID). RVID Version 2 was released on the World Wide Web in June 1999. In the Fort Calhoun Generic Letter 92-01, Revision 1, Supplement 1 closeout letter dated August 9, 1999, the staff requested that the licensee review the data and information in the RVID and provide comments by September 1, 1999. The closeout letter also stated that the staff would assume that the data entered into the RVID are acceptable for Fort Calhoun if no comments are received. Since the staff did not receive comments from Fort Calhoun, the data were assumed to be correct. The licensee should review all data and information, and provide any changes to the staff as soon as possible.

Since the staff has not accepted the methodology in CEN-636, Revision 0, and the unbiased fluence value must be used for calculating  $RT_{PTS}$ , the limiting weld in the Fort Calhoun vessel is projected to exceed the PTS screening criterion prior to expiration of the current license in 2013. The staff requests that you provide the year that the limiting weld is projected to exceed the PTS screening criteria, and any immediate and future plans for addressing the PTS issue for the Fort Calhoun RPV.