

June 5, 1997

Mr. S. K. Gambhir  
Division Manager - Production Engineering  
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

SUBJECT: FORT CALHOUN STATION, UNIT NO. 1 - SUPPLEMENTAL REQUEST FOR  
ADDITIONAL INFORMATION ON THE RESOLUTION OF UNRESOLVED SAFETY ISSUE  
A-46 (TAC NO. M69447)

Dear Mr. Gambhir:

By letter dated August 23, 1996, the Omaha Public Power District provided its response to the staff's request for additional information (RAI), dated June 21, 1996. The RAI requested information on the plant-specific summary report addressing the resolution of unresolved safety issue (USI) A-46 program at the Fort Calhoun Station.

The staff has reviewed your response and determined that further supplemental information is necessary to complete its review of your USI A-46 response. We have enclosed the supplemental request for additional information.

Please provide written responses to the enclosed questions within 30 days of receipt of this letter.

Sincerely,

Original Signed By  
L. Raynard Wharton, Project Manager  
Project Directorate IV-2  
Division of Reactor Projects - III/IV  
Office of Nuclear Reactor Regulation

Docket No. 50-285

Enclosure: Supplemental Request for  
Additional Information

cc w/encl: See next page

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June 5, 1997

cc w/encl:

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. James W. Chase, Manager

Fort Calhoun Station

Post Office Box 399

Fort Calhoun, Nebraska 68023

Mr. James W. Tills

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

SUPPLEMENTAL REQUEST FOR ADDITIONAL INFORMATION

OMAHA PUBLIC POWER DISTRICT

FORT CALHOUN STATION, UNIT NO. 1

DOCKET NO. 50-285

1. In reference to Attachment 4 of your submittal LIC-96-0121, Calculation No. FC06313, please note the following:
  - a. The nominal allowable capacities of the cast-in-place anchor bolts should be determined in accordance with Section C3 of the GIP, Appendix C. In the computation of allowable tension "P" for cast-in-place anchor on sheet 14 of 37 (Calculation No. FC06313) an anchor is considered as a plain top rebar in a beam. This representation is not conservative since a rebar, most likely will be much longer than an anchor and the end of the rebar is embedded in the compression zone of the beam. Therefore, you are requested to provide a justification for the use of higher tensile allowables than those specified in Appendix C of the GIP for cast-in-place anchors, or revise your computation in conformance with the GIP provision.
  - b. The shear-tension interaction analysis on sheet 15 of 37 does not appear to be valid for the pedestal which is under tension and shear, because under such a condition, either the concrete or the shear reinforcement, not both can be considered to resist the shear. Therefore, your computation of allowable shear "V" should be justified or revised, as discussed in item 1.a above.
  - c. As a result of revised allowable values of "P" and "V", your shear-tension interaction analysis on sheets 26 and 32 of 37 should also be reassessed.
  - d. The proposed modification as shown on sheet 37 of 37 (Calculation No. FC06313) is not clear and the location of the modification in relation to the saddle and the tank as a whole, should be clearly identified.
2. In the computation for USI A-46 Outlier Resolution for Heat Exchanger CH-7, you have not followed Appendix C of the GIP to calculate the bolt capacities on the basis of the embedment length check and edge distance check and have used the anchorage requirement of a plain top bar in a beam to determine the bolt capacities. As indicated in 1. above, such an approach results in overestimation of bolt capacities and is, therefore, unacceptable. We request a re-evaluation of bolt capabilities for this equipment using the approved methodology in Appendix C of the GIP.

3. In the calculation for seismic qualification of the diesel fuel tanks, discussed in Calculation No. FC06011, the theoretical buckling stress is shown to be 76,150 psi which is more than twice the yield stress of 30,000 psi of the steel used. Therefore, the buckling is in the plastic range and hence, the analysis should be made on this basis. You calculated the buckling stress by using the formula in ASME Code Case 284. In accordance with Code Case 284, the formula you used is for local buckling of unstiffened or ring stiffened cylindrical shells under axial compression. Since the diesel fuel tank is buried, it is under both axial compression and hoop compression and the concern is general stability. Therefore, Code Case 284 is not applicable for the required evaluation. The basic allowable buckling stress values should be established on the basis of NE-3131(b), NE-3133 and NE-3222 or other applicable criteria.

On the basis of above observation, we request a re-evaluation of the seismic capability of the diesel fuel tanks.

4. In the evaluation of the seismic resistance of concrete block walls, you have idealized the portion of the wall between Wall No. 10 and row line Q as one way slab with single span and simple support in the horizontal direction. On the basis of such an idealization, you have calculated the seismic bending moment and the corresponding bending stress (21.2 psi) which can be tensile or compressive. This stress is compared to the allowable value  $(f_c)^*$  which is taken as 50 psi. According to Table 10.1 in ACI 531-79 code, the allowable stress for tension normal-to-bed joints is 25 psi. With the idealization of the layer of block wall as a beam, the flexural tension force is normal to the vertical bed joint. A close examination of your calculation for the moment of inertia of the idealized beam section, would indicate the calculated moment of inertia to be for a section of a beam spanned between supports in the vertical direction. On this basis you are requested to re-evaluate the bending stresses in the wall against the corresponding allowable, or provide a justification for the apparent discrepancy in the block wall seismic evaluation.