

June 17, 1997 LIC-97-094

U. S. Nuclear Regulatory Commission Attn: Document Control Desk Mail Station P1-137 Washington, DC 20555

Reference: Docket No. 50-285

SUBJECT: 10 CFR 21 Report on Nonconforming Raw Water Pump Impellers

Pursuant to 10 CFR 21 (d)(3)(ii), Omaha Public Power District (OPPD) provides the attached written notification of a defect in a basic component (Raw Water pump impellers) at Fort Calhoun Station Unit No. 1. Initial notification of this condition was made to the OPPD responsible corporate officer and to the NRC Operations Center on May 23, 1997.

Please contact me if you have any questions.

Sincerely.

James An Fills For

S. K. Gambhir Division Manager Engineering & Operations Support

TCM/tcm

Attachment

c. Winston & Strawn

- E. W. Merschoff, NRC Regional Administrator, Region IV
- L. R. Wherter, NRC Project Manager
- W. C. Walker, NRC Senior Resident Inspector

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Omaha Public Power District (OPPD) Report on Nonconforming Raw Water Pump Impellers

This report is submitted pursuant to 10 CFR 21.21(d)(3)(ii). The items below address the specific information required by 10 CFR 21.21.(d)(4).

(i) Identification of individual providing this notification:

S. K. Gambhir Division Manager - Engineering & Operations Support Omaha Public Power District Fort Calhoun Station P. O. Box 399 Fort Calhoun, NE 68023-0399

(ii) Basic components containing defect:

Replacement impellers for Byron Jackson Raw Water pumps had blade dimensions out of tolerance. Pumps are Model 28RXL 2-stage VCT

(iii) Identification of supplier:

BW/IP International, Inc.

(iv) Nature of Defect:

Raw Water pump assembly AC-10D was replaced due to normal wear on the pump internals, namely the pump impellers and impeller liners. The replacement assembly had been rebuilt with new internal components. After installation, post maintenance and operability testing was performed using a station procedure. The pump did not satisfy the acceptance criteria contained in the test: therefore, the pump remained inoperable. The fact that the pump did not pass the test was very unusual especially considering the pump was completely rebuilt with all new internal subcomponents. The impeller lift setting was reverified and then the post maintenance/operability test was again performed. Again the pump did not pass the test, so the pump assembly was removed and replaced with a another spare pump assembly. U. S. Nuclear Regulatory Commission LIC-97-094 Attachment Page 2

> The "defective" pump assembly was then disassembled for inspection to determine the cause of the extremely poor performance. Upon inspection of the first stage pump impeller, it was noticed that the blade profile was significantly different when compared to the second stage impeller. At least two of the four blades on the first stage impeller appeared to have a "droop" causing the opening or suction eye between the blades to decrease. The size of the suction eye for these particular type of pumps has a large influence on the amount of discharge flow the pump is able to produce. This is because the decreased suction eye size causes the impeller to become extremely inefficient. With the defective impeller installed in the first stage of the pump, discharge flow was drastically affected.

> One other replacement impeller in the warehouse was determined to have similar deficiencies.

Potential Safety Significance

The subject impellers contained dimensional inaccuracies which prevented pump discharge flows from satisfying the acceptance criteria. The estimated reduction of design flow was 20%. The Plant Review Committee conservatively determined that operation of a Raw Water pump AC-10D at the maximum allowable river temperature (90°F) with the defective impeller installed could have created a substantial safety hazard by exceeding a safety limit or causing a major degradation of essential safety-related equipment, considering a single failure in addition to the degraded performance of AC-10D. The river water temperature at the time of discovery was 36°F.

(v) Date information of defect was obtained:

The installation of the replacement pump assembly with the defective impeller and unsuccessful testing was initially identified on April 8, 1997. Based on review of an engineering evaluation of this condition, OPPD management on May 22, 1997 conservatively determined that a defect existed. The OPPD Vice President with executive authority over Part 21 issues was informed on May 23, 1997.

(vi) Number and Location of components containing defect:

Two defective impellers passed the OPPD receipt inspection and were stocked in the warehouse. Because dimensional information is considered proprietary by BW/IP International, the receipt inspection relied on verification of the part number and the fact that BW/IP International is an Appendix B supplier. One of these impellers was used to rebuild a spare pump assembly which was U. S. Nuclear Regulatory Commission LIC-97-094 Attachment Page 3

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installed as Raw Water pump AC-10D. The supplier has not reported these impeller defects. The existence of other similarly defective impellers from this supplier is unknown to OPPD.

(vii) Corrective action which has, or is being taken:

The defective impellers are being returned to the supplier. Raw Water pump AC-10D was replaced with a rebuilt pump assembly which passed all post-maintenance surveillance test requirements. The supplier has been notified about this report.

(viii) Advice related to defect to be given to licensees:

None.