



**Duquesne Light**

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APR 7 1982

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United States Nuclear Regulatory Commission  
Region I  
631 Park Avenue  
King of Prussia, PA 19406

ATTENTION: Mr. R. Haynes, Administrator

SUBJECT: BEAVER VALLEY POWER STATION - UNIT NO. 2  
Docket No. 50-412  
Auxiliary Feedwater Pump  
Impeller Wear Rings - Significant  
Deficiency Report 81-04



Gentlemen:

The attached Final Report on Significant Deficiency 81-04 provides a discussion of the corrective action taken and the final resolution of this deficiency.

DUQUESNE LIGHT COMPANY

By E. J. Woolever  
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Vice President

Attachment

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BV-2 Licensing File (KAT)

References:

- 1) 2DLS-12952 dated 12/15/81 "Auxiliary Feed Pump Impeller Ring, 2BV-208, Cracking Potential Reportable Deficiency"
- 2) 2DLC-4402 dated 12/18/81 "Auxiliary Feedwater Pump Impeller Wear Rings Significant Deficiency Report 81-04"
- 3) 2DLS-13348 dated 2/05/82 "Auxiliary Feed Pump Impeller Ring, 2BV-208 Cracking Potential Reportable Deficiency"
- 4) 2DLC-4485 dated 2/25/82, "Auxiliary Feedwater Pump Impeller Wear Rings - Significant Deficiency Report 81-04"
- 5) 2DLS-13735 dated 3/29/82, "Auxiliary Feedwater Pump Impeller Wear Rings - Final Report on Significant Deficiency 81-04"

FINAL REPORT  
OF  
AUXILIARY FEED PUMP IMPELLER RING CRACKING  
AT  
BEAVER VALLEY POWER STATION - UNIT NO. 2

1.0 SUMMARY

During a post test inspection of the Turbine Driven Auxiliary Feed Pump (2FWE-P22) (TDAFP) performed at the Terry Turbine Corporation, on September 10, 1981, several cracked impeller wear rings were discovered. Should this condition also have existed on the Motor Driven Auxiliary Feed Pumps (2FWE-P23A&B) (MDAFP) there was a potential for complete wear ring failure and the resulting loss of pump performance.

2.0 IMMEDIATE ACTION TAKEN

Upon discovery of the cracked impeller wear rings on the TDAFP, the entire pump/turbine assembly was returned to the Bingham Willamette Company (BWC) in Portland, Oregon for a complete engineering assessment.

The BWC engineering assessment attributed the impeller wear ring cracking to the use of previously used rings when the impeller was replaced prior to the delivery of the pump. The additional stresses imposed on the rings by removal and re-installation are the probable cause of the cracking.

Because the MDAFP impellers were also replaced, it was possible that similar problems existed in these pumps. The rotating elements from the MDAP's were removed, visually inspected, and returned to the BWC for evaluation. No cracks were discovered in the visual inspection.

3.0 DESCRIPTION OF DEFICIENCY

Cracked impeller wear rings at the securing pin hole juncture on various impeller stages of the TDAFP were evaluated by the BWC. Because of the similarity in construction of the TDAFP and the MDAFP's, it was determined that there was a potential for impeller wear ring failure and loss of pump performance on these pumps also.

4.0 ANALYSIS OF SAFETY IMPLICATION

A reduction in auxiliary feed pump performance could have resulted in the reduction of residual heat removal capability.

5.0 CORRECTIVE ACTION TO REMEDY DEFICIENCY

The wear rings on all Auxiliary Feedwater Pumps have been replaced. The BWC evaluation indicated that the TDAFP wear ring failure was caused by the improper reuse of the rings and that the MDAFP wear rings were serviceable as furnished. To prevent the reoccurrence of this problem, the BWC has issued an engineering directive prohibiting the reuse of any wear ring materials after their removal from the rotating elements.