



Commonwealth Edison

One First National Plaza, Chicago, Illinois
Address Reply to: Post Office Box 767
Chicago, Illinois 60690

June 9, 1983

Mr. James G. Keppler, Regional Administrator
- Region III
U.S. Nuclear Regulatory Commission
799 Roosevelt Road
Glen Ellyn, IL 60137

Subject: Byron Station Units 1 and 2
10 CFR 50.55(e) 30 Day Report
Reactor Coolant Pump 1A Bearing Failure
NRC Docket Nos. 50-454/455

Dear Mr. Keppler:

On May 5, 1983, the Commonwealth Edison Company Project Engineering Department notified Mr. Julian M. Hinds of your office of a deficiency reportable pursuant to 10 CFR 50.55(e) regarding the Reactor Coolant Pump 1A bearing failure at our Byron Station. For your tracking purposes, this deficiency was assigned Number 83-07.

This letter fulfills the thirty (30) day reporting requirements of 10 CFR 50.55(e) regarding this matter and is considered to be an interim report. Our delay in submittal of this report was discussed with Mr. Hinds on June 6, 1983.

Description of Deficiency

During hot functional testing at Byron Unit 1, the Reactor Coolant Pump 1A experienced a radial bearing failure. The pump was operating for less than 40 minutes and no abnormal operating parameters were observed until a rise in #1 seal leakoff temperature occurred. However, it did not exceed recommended temperature limits. In addition, a rapidly oscillating seal flow rate was observed. On the basis of these two conditions, the pump was shut down. Subsequent disassembly and inspection revealed the severe damage. The defective pump internals were removed and returned to Westinghouse for further examination and evaluation to determine the cause of failure.

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Attached to this report is the summary of a preliminary analysis performed by Westinghouse EMD to determine the extent of damage and cause of failure. Preliminary evaluation indicates that the pump shaft and bearing cartridge are salvageable, however the journal and internal bearing components will be replaced. The only probable cause of failure which is apparent at this time is the introduction of foreign particles into the bearing annulus.

Analysis of Safety Implications

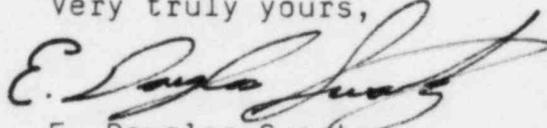
The pump bearing failure occurred during hot functional testing with no fuel in the reactor. Abnormal pump parameters were promptly observed and the pump was immediately shut down. Westinghouse considers this pump failure to be an isolated case with no generic implications. All other reactor coolant pumps performed satisfactorily during hot functional testing. In our judgement, there are no safety implications as a result of this incident because unit operation could not commence without repairing this reactor coolant pump.

Corrective Action

All damaged pump internals were replaced with an identical internals unit from the Unit 2A Reactor Coolant Pump. Hot functional testing was resumed and the 1A RCP performed satisfactorily. The damaged 1A pump internals are under further inspection and analysis by Westinghouse EMD. The extent of replacement components required for the 2A pump is still under investigation. A final report indicating the cause of the failure and a schedule for providing replacement or repaired parts for the Unit 2 pump is expected to be available in ninety (90) days.

Please address any questions that you or your staff may have concerning this matter to this office.

Very truly yours,



E. Douglas Swartz
Nuclear Licensing Administrator

Attachment

cc: RIII Inspector - Byron

Director of Insp. and Enf.
U.S. Nuclear Commission
Washington, DC 20555

Summary From Preliminary Analysis
By Westinghouse EMD

The failure of the bearing in the Byron Pump has caused significant damage to the shaft and the radial bearing cartridge assembly. The journal on the shaft is severely torn and discolored. The shaft has a bow of approximately .007" in the area of the journal and evidence of rubbing of the labyrinth seals in the heat exchanger area. Preliminary evaluation indicates that this shaft may be salvaged but final determination cannot be made until after reinspection once the journal is removed. The bearing cartridge assembly was received with three of the four graphitar segments destroyed and the fourth severely damaged. The retaining ring was forced out of the assembly causing damage to the cartridge in the area of the pins that retain the ring. The graphitar segments, the retaining ring, and the pins need to be replaced. The cartridge can be repaired.

A detailed schedule of the repair cannot be provided until all inspection results are available. This is anticipated to be the end of June. A "worst case" estimate, however, would occur if the shaft forging required replacement. Procurement of material (24 weeks after order placement) and machining and balancing (20 weeks) indicate a "worst case" of nominally 44 weeks to repair this pump.

The 14 x 14 bearing design utilized in this 93A pump has been used in approximately 160, 93A units. Additionally it is incorporated in the 93, 93A-1, and 100 Model Pumps. Many of these latter units (primarily 93A-1 and 100) are not in service at this time. All of these pumps, however, were tested prior to shipment. To date, no failure of this type has been experienced either in service or on test. Also, preliminary evaluation of the records of the Byron pump do not reveal any deficiencies which may have contributed to or caused this failure. Further review of all data (test, inspection, etc.) is continuing to more accurately evaluate this statement. On the basis of these factors the only probable cause which is apparent at this time is the introduction of foreign particles into the bearing annulus. The presence of particles in this area would very likely begin to abrade the graphitar segments causing them to chip. These graphitar particles could then cause further disintegration of the segments and damage to the journal surface.

Due to the points established in the preceding paragraph, EMD does not consider this failure to be generic in nature.