

REPORT OF ABNORMAL OCCURRENCE AND/OR INCIDENT

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(TEMPORARY FORM)

CONTROL NO: 6281

FILE: INCIDENT REPORT FILE

FROM: Metropolitan Edison Reading, Pa R C Arnold	DATE OF DOC 6-6-75	DATE REC'D 6-9-75	LTR XX	TWX	RPT	OTHER
TO: Director, Division of Nuclear Licensing	ORIG 1 signed	CC	OTHER	SENT AEC PDR <u>XXXXX</u> SENT LOCAL PDR <u>XXXXXX</u>		
CLASS UNCLASS XXXXXX	PROP INFO	INPUT	NO CYS REC'D 1	DOCKET NO: 50-289		

DESCRIPTION: Ltr concerns abnormal occurrence report No. AO 50-289/75-14 on 5-23-75, the in-operative decay heat river water pump DR-P-1B threaten to cause an Engineered Safeguards feature or system to be incapable of performing its intended function...

ENCLOSURES:

PLANT NAME: Three Mile Island # 1

FOR ACTION/INFORMATION

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METROPOLITAN EDISON COMPANY

SUBSIDIARY OF GENERAL PUBLIC UTILITIES CORPORATION

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June 6, 1975
GQL 1126



Director
Division of Reactor Licensing
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Sir:

Operating License DPR-50
Docket No. 50-289

In accordance with Technical Specifications for the Three Mile Island Nuclear Station Unit 1 we are reporting the following abnormal occurrence:

- (1) Report Number: AO 50-289 / 75-14
- (2a) Report Date: June 6, 1975
- (2b) Occurrence Date: May 23, 1975
- (3) Facility: Three Mile Island Nuclear Station Unit 1 (TMI-1)
- (4) Identification of Occurrence:

6-9-75
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Title: Inoperative Decay Heat River Water Pump DR-P-1B

Type: An abnormal occurrence as defined by the Technical Specifications, paragraph 1.8d, in that the inoperative decay heat river water pump DR-P-1B threatened to cause an Engineered Safeguards feature or system to be incapable of performing its intended function.

- (5) Conditions Prior to Occurrence:

The reactor was in routine start-up with major plant parameters as follows:

Power: Core: 20%

Elec: 113 MW (Gross)

RC Flow: 136×10^6 lb/hr

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RC Pressure: 2146 psig

RC Temp: 579°F

PRZR Level: 228 in.

PRZR Temp: 647°F

(6) Description of Occurrence:

At 1400 on May 23, while running the B Decay Heat River Water Pump (DR-P-1B) during normal surveillance testing, the motor shaft sheared above the coupling. The DR-P-1B pump was immediately removed from service and the redundant pump DR-P-1A was tested to verify operability.

On May 25, the reactor was placed in cold shutdown in accordance with the requirements of Technical Specifications 3.3.1 and 3.3.2.

(7) Designation of Apparent Cause of Occurrence:

After extensive investigation, our analysis has shown that the cause of the shaft failure was rotating bending fatigue. Contributing factors are felt to be

- a. mechanical design in that the upper pump bearing was found to have excessive clearance due to pump shaft vibration and eccentricity
- b. installation in that there was possible misalignment between motor and shaft
- c. material in that there is some evidence of a fatigue failure as a result of a., b., and d.
- d. structural design in that hydraulic forces due to pump startup appear to have contributed.

Upon inspection of the DR-P-1A discharge check valve it was discovered that the hinge pin was missing and that the disc was lying on the bottom of the valve. It is possible that the resulting impact force, with the disc creating sudden flow restriction, created forces which were reflected back to the motor shaft. In addition, a crack was observed in the motor endbell.

Further investigations are continuing as described below.

(8) Analysis of Occurrence:

It is believed that the failure of DR-P-1B did not represent a threat to the health and safety of the public in that only one decay heat river water pump is necessary to supply sufficient emergency cooling water in the event of a loss-of-coolant accident and the redundant DR-P-1A decay heat river water pump was verified as operable.

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(9) Corrective Action:

Immediate corrective action was taken to return the DR-P-1B pump motor to the vendor for repair and replacement of the shaft and motor endbell. As a complete pump inspection indicated excessive wear on the upper pump shaft bearing closest to the coupling, all nine pump shaft bearings were replaced. Although eight bearings were found to be acceptable it was deemed prudent to replace them at the time the pump was disassembled.

A complete examination and repair of the failed discharge check valve took place under the direction of a vendor representative.

The pump discharge strainer was disassembled and inspected with no signs of wear or damage.

Upon reassembly, a complete electrical check was performed on the motor as well as a functional test on the pump after acceptable motor checkout.

Cracks were observed in the concrete foundation of DR-P-1B. A base plate "hold-down" clamp was installed to assure the DR-P-1B baseplate is anchored in such a manner as to assure meeting the original seismic design criteria.

When DR-P-1B was declared operable, DR-P-1A was removed from service for inspection of the discharge check valve. As a small crack on one rib of the endbell was found, the endbell of the motor was replaced.

It should be noted that all other river water pumps, motors, and foundations were examined for similar problems. All river water pump motor endbells were magnafluxed to determine if further cracks exist. It was discovered that nuclear services river water pump NR-P-1A had a cracked endbell and that some cracks exist in the foundation NR-P-1A on a baseplate. The endbell will be replaced upon receipt of a replacement. The adequacy of the pump baseplate with regard to its intended seismic criteria was further assured by incorporating the same modification as incorporated on DR-P-1B.

Long term corrective actions are being taken as follows. Anti-thrust restraints for the twelve river water pumps will be installed. These restraints will connect and secure the pump assembly to the screen house east wall.

Repairs will be made to replace the cracked endbell for NR-P-1A upon receipt of a replacement. When cracked endbell has been replaced, the pump will be declared operable.

The Plant Operations Review Committee and the Station Superintendent reviewed and gave their approval of these actions. A pump surveillance program will be instituted and performed on a routine basis until a definite conclusion can be drawn regarding this shaft failure. Details of the program are available at the TMI-1 site.

(10) Failure Data:

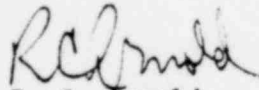
Previous Failures:

None

Equipment Identification:

Manufacturer - Westinghouse
Type and Frame - 445 TBH
HP - 200
Frequency - 60 Hz, 3 phase
Volts - 460
RPM - 1180
Amps - 230

Sincerely,



R. C. Arnold
Vice President

RCA:RSB:tas

cc: Office of Inspection and Enforcement
U. S. Nuclear Regulatory Commission
631 Park Avenue
King of Prussia, PA 19406

File: 20.1.1 / 7.7.3.5.1

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