



Commonwealth Edison
Quad-Cities Nuclear Power Station
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IE FILE COPY



NJK-76-411

November 10, 1976

J. Keppler, Regional Director
Office of Inspection and Enforcement
Region III
U. S. Nuclear Regulatory Commission
799 Roosevelt Road
Glen Ellyn, Illinois 60137

Reference: Quad-Cities Nuclear Power Station
Docket No. 50-254, DPR-29, Unit 1
Appendix A, Sections 3.5.E.1 and 6.6.B.1.e

Enclosed please find Reportable Occurrence Report, No. RO 50-254/76-33 for Quad-Cities Nuclear Power Station. This occurrence was previously reported to Region III, Office of Inspection and Enforcement by telephone on October 29, 1976 and by telecopy on November 1, 1976.

This report is submitted to you in accordance with the requirements of Technical Specification 6.6.B.1.

Very truly yours,

COMMONWEALTH EDISON COMPANY
QUAD-CITIES NUCLEAR POWER STATION

N. J. Kalivianakis
Station Superintendent

NJK/LFG/lk

cc: G. A. Abrell

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PDR ADOCK 05000254
S PDR

NOV 15 1976

LICENSEE EVENT REPORT

CONTROL BLOCK: 1 2 3 4 5 6

(PLEASE PRINT ALL REQUIRED INFORMATION)

| | | | |
|--|---|---|--|
| LICENSEE NAME 01 1 L Q A 01 | LICENSE NUMBER 0 0 - 0 0 0 0 0 - 0 0 | LICENSE TYPE 4 1 1 1 1 | EVENT TYPE 0 1 |
| CATEGORY 01 CONT | REPORT TYPE T | REPORT SOURCE L | DOCKET NUMBER 0 5 0 - 0 2 5 4 |
| EVENT DATE 1 0 2 9 7 6 | REPORT DATE 1 1 1 0 7 6 | | |

EVENT DESCRIPTION

02 While performing routine Reactor Core Isolation Cooling (RCIC) System pump operability
03 surveillance, it was discovered that the pump could not achieve the flow and pressure
04 as required by Technical Specification 4.5.E.1. By surveillance procedure, the pump
05 should provide a discharge pressure of 1250 psig at a flow of 400 gpm. The 1250 value
06 accounts for a reactor vessel pressure of 1150 psig, plus line pressure losses

| | | | | | |
|---|---|---|---|---|--|
| SYSTEM CODE 07 C E | CAUSE CODE E | COMPONENT CODE P U M P X X | PRIME COMPONENT SUPPLIER N | COMPONENT MANUFACTURER B 2 6 0 | VIOLATION N |
|---|---|---|---|---|--|

CAUSE DESCRIPTION

08 (Proximate Cause-Equipment Failure) The pump was disassembled and it was found that
09 two of the five stages were severely damaged. The procedure for starting the pump
10 states that the test return valve to the contaminated condensate storage (see attached)

| | | | | |
|---|--|--|--|---|
| FACILITY STATUS 11 E | % POWER 0 9 4 | OTHER STATUS NA | METHOD OF DISCOVERY B | DISCOVERY DESCRIPTION Routine surveillance testing |
|---|--|--|--|---|

| | | | |
|---|---|--|---|
| FORM OF ACTIVITY RELEASED 12 Z | CONTENT OF RELEASE Z | AMOUNT OF ACTIVITY NA | LOCATION OF RELEASE NA |
|---|---|--|---|

PERSONNEL EXPOSURES

| | | |
|--|---|---|
| NUMBER 13 0 0 0 | TYPE Z | DESCRIPTION NA |
|--|---|---|

PERSONNEL INJURIES

| | |
|--|---|
| NUMBER 14 0 0 0 | DESCRIPTION NA |
|--|---|

OFFSITE CONSEQUENCES

| | |
|--|--|
| 15 | NA |
|--|--|

LOSS OR DAMAGE TO FACILITY

| | |
|--|---|
| TYPE 16 Z | DESCRIPTION NA |
|--|---|

PUBLICITY

| | |
|--|--|
| 17 | NA |
|--|--|

ADDITIONAL FACTORS

18 (Event Description contd) and head differential between the RCIC pump discharge and
19 the reactor vessel. The pump actually delivered 400 gpm at 1200 psig. (contd)

NAME: T. P. Joyce PHONE: 309-654-2241 Ext. 247

CAUSE DESCRIPTION continued

tank be opened prior to rolling the RCIC turbine. This results in a situation where the pump is started with no resistance to flow. It is conceivable that during this situation, the pump could pump itself dry and the resulting water slug filling the void in the pump would have jolted the two impellers loose. After the impellers came loose, continuous running of the pump resulted in damage to the two impellers.

ADDITIONAL FACTORS

Event Description continued

An investigation as to the nature of the problem was initiated. Pump discharge flow and pressure instrumentation were calibrated, and all valve positions were verified. A subsequent pump flow rate test, however, revealed that the pump performance was worsening. Since turbine speed was normal, and other system and turbine parameters were observed to be satisfactory, an internal pump problem was suspected. The RCIC System was then declared inoperable and work request 4045-76 was issued to inspect the pump. The High Pressure Coolant Injection (HPCI) System was then tested in accordance with Technical Specification 4.5.E.2, and was found to be fully operable.

The RCIC turbine-driven pump is required to be operable whenever reactor pressure is greater than 150 psig. In accordance with Technical Specification 3.5.E.2, RCIC may be inoperable for seven days in order for reactor operation to continue, if HPCI is tested immediately and daily thereafter. Repairs to the pump were started immediately, but Unit One was shutdown on November 2, 1976 due to electromatic relief valve problems. An agreement was reached with the NRC which allowed the unit to be started up and subsequently operated with RCIC inoperable, under the stipulation that the HPCI system is demonstrated operable daily. This agreement is in effect from November 6 through November 20, 1976. Since the HPCI system has been demonstrated to be fully capable of performing its intended function in the required manner during the repair period, this occurrence has not resulted in any adverse reactor safety implications. (RO-50-254/76-33)

Corrective Action to Prevent Recurrence

The RCIC pump casing was sent out to the Bingham Pump Co. for rebuilding, and a new rotating element has been ordered. This new element will have snap rings on the first four stages for reinforcement, while the fifth stage will have two set screws, 180° apart, for reinforcement. The rotating element for Unit Two will also be changed at the earliest opportunity after the new parts are received. To aid in preventing recurrence in the future, a procedure change has been initiated to start the pump with the discharge valve to the condensate storage tank closed, and establish initial flow with the minimum flow valve. To date repairs have not been completed. An Update Report will be submitted upon completion of repairs and operability testing.

Failure Data

This is the first occurrence of this type at Quad-Cities Station whereby the RCIC pump has caused the system to be rendered inoperable. Prior RCIC failures have been related to valves and the turbine.

The RCIC pump is a 5-stage horizontal centrifugal pump, manufactured by Bingham Pump Company.