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LWP-95-078

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U.S. Nuclear Regulatory Commission
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Reference: Quad Cities Nuclear Station
Docket Number 50-254, DPR-29 Unit One

Subject: Licensee Event Report (LER) 254/95-001 Supplemental
Information.

As stated in LER 254/95-001, supplemental information is being provided and is enclosed as Attachment 1. This information constitutes revision 01 to the original LER documentation.

Attachment 2 is a reproduction of the original text of LER 254/95-001.

If there are any questions or comments concerning this letter, please refer them to Nick Chrissotimos, Regulatory Assurance Administrator at 309-654-2241, ext. 3100.

Respectfully,

COMMONWEALTH EDISON COMPANY
QUAD CITIES NUCLEAR STATION

D.B. Cook for

L.W. Pearce
Station Manager

Attachment 1- LER Supplemental Information
Attachment 2- LER 254/95-001 (copy)

cc: J. Schrage
C. Miller
INPO Records Center
NRC Region III

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To: Jeff Neal

Prepared By: Matt Levy

From: Paul Aitken

Date: 8/22/95

Subject: Closure of NTS# 25418095001001; Supplemental Report Information

Background

This report is presented as Supplemental Report Information to LER 95-001.

The LER identified the primary cause of the RCIC governor valve failing was corrosion on the valve stem. The exact cause of the corrosion was not identified, however, several items were thought to be contributing factors: material incompatibility between valve stem and washers, and the high carbon content spacers.

Issue

In addition to the above mentioned contributing factors, the presence of moisture on the valve stem became the primary candidate for the cause of the corrosion.

Corrective action included the removal and replacement of incompatible materials along with low carbon content spacers. However, the largest impact to the arrestment of our valve binding due to corrosion was, in fact, the reducing of moisture around the valve stem.

Justification

Before the occurrence of this event:

RCIC turbine was operated monthly

RCIC turbine was in operation for a period of 15-25 minutes during these runs

RCIC Vacuum pump was run for 15 minutes

Corrective Action to reduce the moisture around the valve stem:

RCIC turbine continues to operate monthly*

RCIC turbine remains running for a minimum of 60 minutes each time its running**

RCIC Vacuum pump is run for 30 minutes after the turbine is shut down

* Since this event, Unit 1 RCIC experienced an inadvertent Turbine Trip/Throttle event. The corrective action for this event included twenty-seven(27) successful consecutive starts of the RCIC Turbine over a time period of 2 1/2 months. This validated that the corrective actions taken to arrest the valve stem binding by reducing the moisture around the valve was working.

** The time period of 60 minutes was determined from an experiment performed on Unit 1(16 May 95), in which temperature data was taken at four(4) locations: Turbine Trip/Throttle valve, outboard side of the governor valve, inboard side of the governor valve and the outboard side of the turbine casing. The experiment proved that it took between 55 and 60 minutes for the four(4) locations to reach their maximum steady-state temperatures during operation of the Turbine. We call this the "steam boil off time".

Unit 2 Governor valve stem was disassembled during Q2R13 under NWR# Q19941. Disassembly revealed normal wear and associated corrosion. The valve stem was replaced along with compatible washer material and low carbon spacers. Toward the end of this outage, during the RCIC Logic Testing, the Turbine accidentally became flooded when the failure of the barometric condenser receiver tank pump motor failed to remove water coming from the minimum flow valve. The outboard side of the governor valve stem showed signs of corrosion within 24 hours of the event. The valve was disassembled and revealed slight corrosion on the stem, however, the washers showed extreme corrosion. After wiping off the stem there was no pitting which allowed this stem to be reused. The washers were removed and replaced with new low carbon spacers.

Conclusion

The flooding event proved that corrosion from moisture occurs very quickly. It also proved that the washers corrode faster than the stem, especially if the valve stem has little to no wear. The opportunity of corrosion occurs faster with parts that are worn, including parts that have any protective coatings(ie;nitrited).

By running the turbine for 60 minutes the moisture around the valve stem has the chance to boil off. And by running the Vacuum pump for an additional 15 minutes from the previous 15 minute time period draws off any additional moisture which can accumulate around the valve stem. Additionally, the RCIC Logic Testing procedures have been reviewed and changed to eliminate the possibility of any accidental flooding.

On 16 June 1995, NRC Information Notice 94-66, Supplement 1 entitled "Overspeed of Turbine-driven pumps caused by binding in stems of governor valves" emphasized the importance of reducing moisture around the valve stem.

Without moisture corrosion can not exist. Reducing or eliminating the amount of moisture around valve stem will decrease the opportunity for corrosion to occur and the possibility of the valve stem to bind.

(final)