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LWP-95-080

August 24, 1995

U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555

Reference: Quad Cities Nuclear Station
Docket Number 50-265, DPR-30, Unit Two

Subject: Licensee Event Report (LER) 265/95-001 Supplemental
Information.

As stated in LER 265/95-001, 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 265/95-001.

This report is submitted in accordance with the requirements of the Code of Federal Regulations, Title 10, Part 50.73(a)(2)(ii)(B), "Any event or condition that resulted in the condition of the nuclear power plant, including its principal safety barriers, being seriously degraded or that resulted in the nuclear plant being in a condition that was outside the design basis of the plant."

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


L. W. Pearce
Station Manager

Attachment 1- LER Supplemental Information
Attachment 2- LER 265/95-001 (copy)

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

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Station Support Engineering Department

August 23, 1995

To: L. W. Pearce,
Station Manager

From: A. Blamey, 
Station Support Engineering Supy.

Subject: Supplemental Report on LER 95-001

Reference: LER 95-001

Upon completion of Appendix J Type C Local Leak Rate testing, nine valves failed to meet their respective acceptable leakage limits. These valves have been or are undergoing an investigation to determine the root cause behind the testing failures. This report is an update on those investigations.

Valve(s): AO 2-0203-2C (2C MSIV)

As-found Leakage: 14.4 SCFH

Acceptable Limit: 11.5 SCFH

As-Left
(Post-Maintenance): 4.4 SCFH

Root Cause(s):

1. Poor alignment of the guide to seat ring due to eccentricities in the various bores and registers from the original manufacturer (Crane Valve). This is from original assembly/machining by the vendor.
2. Low Spot on the seat ring. Installation and machining of the seat ring creates stresses in the seat ring assembly. After heat up and subsequent cooldown, high and low spots appear (sometimes after only one fuel cycle). The disparity between hot and cold LLRT results in an indicator of this condition.

Corrective Action:

1. Removed seat liner (guide) , and replaced with new non-welded design.
2. Bores were checked and machined concentric prior to liner installation.

Status: CLOSED

Station Support Engineering Department

Valve(s): AO 2-0220-44 & 45

As-found Leakage: 21.5 SCFH

Acceptable Limit: 10.0 SCFH

As-Left
(Post-Maintenance): 4.82 SCFH

Root Cause(s): The root cause was attributed to the loss of sealing integrity between the seat and disc due to wear. The cause described is an apparent cause based on information gathered during the investigation. The failure is solely attributed to the 2-0220-44 valve based on observations recorded during operation and the evidence obtained during disassembly.

Corrective Action: Replaced the plug, cage, stem and diaphragm.

Status: CLOSED

Valve(s): 2-0220-58B, Feedwater Check Valve

As-found Leakage: Too large too quantify.

Acceptable Limit: 30.0 SCFH

As-Left
(Post-Maintenance): 0.7 SCFH

Root Cause(s): Corrective action was to replace the disc and seat assembly. The root cause investigation is still in progress awaiting the post-outage disassembly and inspection of the removed valve disk and seat. This investigation is being tracked by Problem Investigation Report (PIF) 95-569 and has an expected completion date of December 1, 1995. A supplemental report will be submitted to the NRC only if the root cause investigation reveals an atypical failure mode.

Status: OPEN

Station Support Engineering Department

Valve(s): 2-1101-16, SBLC Injection Check Valve

As-found Leakage: 12.5 SCFH

Acceptable Limit: 10.0 SCFH

As-Left
(Post-Maintenance): 3.7 SCFH

Root Cause(s): The root cause was attributed to excessive clearances between the disc and guide that allowed the disc to become misaligned with the valve seat. The valve is a 1½" Crane lift style check that relies on gravity and tapered seating surfaces to position the disc on the seat. A disc guide is incorporated in the valve body to direct the disc toward the seat. Wear of the disc guide helped contribute to the failure however the clearances (nominally 0.022") designed into this valve model allowed the disc to move excessively. Testing revealed that with the disc properly seated, air pressure injected downstream of the valve would force the disc to move or tilt away from the seat causing a leak path. Subsequent troubleshooting on this valve and experience obtained from a similar valve failure on Unit 1 demonstrated the ineffectiveness of this valve design in this application even when the valve was new. The final corrective action was to replace the valve with another valve of a different manufacturer and design.

Corrective Action: Replaced valve with an Edwards lift check valve.

Status: CLOSED

Valve(s): AO 2-1601-60

As-found Leakage: Too large too quantify.

Acceptable Limit: 30.0 SCFH

As-Left
(Post-Maintenance): 1.8 SCFH

Root Cause(s): Corrective action was to completely replace the valve. The root cause investigation is still in progress awaiting the post-outage disassembly and inspection of the removed valve (currently scheduled for October 23, 1995). This investigation is being tracked by Problem Investigation Reports (PIF) 95-1728 and 95-1120. A supplemental report will be submitted to the NRC only if the root cause investigation reveals an atypical failure mode.

Status: OPEN

Station Support Engineering Department

Valve(s): AO 2-2599-4A

As-found Leakage: 40.2 SCFH

Acceptable Limit: 30.0 SCFH

As-Left
(Post-Maintenance): 0.3 SCFH

Root Cause(s): The root cause was attributed to insufficient seating force. The valve is a 1" Anchor/Darling (formally W-K-M) air-operated valve. The valve is designed to open with air pressure and close under spring force when the air pressure is removed. Testing of actuator set point with packing forces present revealed that the disc would "crack" off the seat at 3 psig. The vendor indicated that the "cracking" pressure with packing forces present should be 10 psig to ensure leak tight shutoff. The spring adjustment screw was found adjusted to its maximum force value and thus incapable of setting to the recommended value. Discussions with the vendor revealed that the original valve manufacturer (W-K-M) designed the valve to "crack" at 6 psig which by today's standards is too low. In addition, dimensional analysis indicated that this specific valve was assembled with components on the extreme end of their tolerance resulting in less than normal spring preload and accounting for the inability to achieve more than 3 psig.

Corrective Action: Installed a longer closure spring preload adjustment screw.

Status: CLOSED

Valve(s): AO 2-0203-2B (2B MSIV)

As-found Leakage: 39.3 SCFH

Acceptable Limit: 11.5 SCFH

As-Left
(Post-Maintenance): 1.84 SCFH

Root Cause(s):

1. Poor alignment of the guide to seat ring due to eccentricities in the various bores and registers from the original manufacturer (Crane Valve). This is from original assembly/machining by the vendor.
2. Low Spot on the seat ring. Installation and machining of the seat ring creates stresses in the seat ring assembly. After heat up and subsequent cooldown, high and low spots appear (sometimes after only one fuel cycle). The disparity between hot and cold LLRT results in an indicator of this condition.

Corrective Action:

1. Removed seat liner (guide), and replaced with new non-welded design.
2. Bores were checked and machined concentric prior to liner installation.

Status: CLOSED

Station Support Engineering Department

Valve(s): 2-3799-31,

As-found Leakage: Too large too quantify.

Acceptable Limit: 20.0 SCFH

As-Left
(Post-Maintenance): 0.4 SCFH

Root Cause(s): The root cause investigation is attributed to mechanical binding of one of the discs in a partially open position. The binding is a result of having inadequate clearance between the valve body, discs, and bearings. During disassembly of the valve, it was observed that each of the discs could be made to hang up if they were allowed to close with spring force only. Further examination revealed that the valve internals had zero lateral clearance along the length of the hinge pin. In addition, five (5) bearings were found installed into the valve rather than four (4) specified on the assembly drawing. Work history indicated that the 5th bearing/spacer was installed by the manufacturer. The valve has never been completely disassembled since it was received new from the vendor. The valve was partially disassembled and inspected in 1990 following an earlier LLRT failure. The inspection notes indicate the valve had "weak springs", but it is more likely high friction loads existed that would have given false indication of weak springs. The valve was then cleaned and reinstalled without replacing any parts. This type of failure is also time dependent. The valve, even with the "tight" clearances, will perform acceptably until surface friction exceeds the opposing spring force. In this case, the surface friction increased from normal corrosion products that built up on the discs and imbedded in the teflon bearings.

Corrective Action: Replaced valve.

Status: CLOSED

Valve(s): AO 2-4699-47

As-found Leakage: 21.5 SCFH

Acceptable Limit: 10.0 SCFH

As-Left
(Post-Maintenance): 0.5 SCFH

Root Cause(s): Sludge-like substance was found on the valve seat, a characteristic of moisture and oil in the service air. The station's service air compressors will always produce air with this type of residue.

Corrective Action: Cleaned and reassembled valve.

Status: CLOSED
