



Consumers
Power
Company

File

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October 2, 1983

83-08 #1

Mr J G Keppler
Regional Administrator
US Nuclear Regulatory Commission
Region III
799 Roosevelt Road
Glen Ellyn, IL 60137

MIDLAND ENERGY CENTER PROJECT
DOCKET NOS 50-329 AND 50-330
CHECK VALVES IN COMPONENT COOLING WATER SYSTEM
FILE: 0.4.9.80 SERIAL: 23802

On September 2, W R Bird notified Mr J Harrison and Mr R Gardner of your staff of a 50.55(e) reportable condition concerning incorrectly installed check valves in the component cooling water system. This letter is a final report in that the process and part corrective actions are completely described in the attached report, along with the schedule for replacing the check valves.

James W. Cook

JWC/WRB/lr

Attachments: 1) MCAR-1, Report No 72, dated 9/2/83

2) MCAR-72, Final Report, dated September 15, 1983,
"Incorrectly Installed Check Valves in the Component
Cooling Water System"

CC: Document Control Desk, NRC
Washington, DC

RJCook, NRC Resident Inspector
Midland Nuclear Plant

DHood, USNRC NRR

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PDR ADCK 05000329
S PDR

OC0983-0028A-MP01

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September 6, 1983

127286

ATTACHMENT 1
Serial: 23803BECHTEL POWER
CORPORATION

QUALITY ASSURANCE PROGRAM MANAGEMENT CORRECTIVE ACTION REPORT

MCAR-1

REPORT NO. 72

JOB NO. 7220

Q NO. _____

DATE 9/2/83

I* DESCRIPTION (Including references):

During a review of the installation at the Midland site, a concern was raised involving ten nuclear class 2 check valves in the component cooling water (CCW) inlet piping to the reactor coolant pump (RCP) seal coolers. The valves in question are located in vertical sections of piping with flow upward, which is an acceptable design condition when using check valves qualified for vertical installation. Contrary to this, the components procured for this application are not functional when installed in the vertical position. (continued)

* RECOMMENDED ACTION (Optional)

- 1) Revise and issue design change as required to applicable drawings and schedule.
- 2) Review all Q check valves located in vertical sections of piping to ensure that valves are of the correct type and will function in accordance with FSAR and system design criteria.
- 3) Determine root cause of deficiency and take appropriate corrective action to preclude recurrence.
- 4) Issue Interim or final report by 9/16/83.

REFERRED TO ☒ ENGINEERING ☐ CONSTRUCTION ☐ QA MANAGEMENT ☐ _____
☐ PROCUREMENT

ISSUED BY J.E. Crosby 9/2/83
Project QA Engineer Date

II REPORTABLE DEFICIENCY

☐ NO ☒ YES

NOTIFIED CLIENT 9/1/83
John P. [Signature] 9/1/83
Project Manager Date

III CAUSE

CORRECTIVE ACTION TAKEN

AUTHORIZED BY _____
Date

STANDARD DISTRIBUTION

DIVISION QA MANAGER
MANAGER OF QA - BPC
GPD - QA MANAGER
LAPD QA MANAGER
SFPD QA MANAGER
PROJECT MANAGER
CLIENT

ADDITIONAL DISTRIBUTION - AS APPROPRIATE

ENGINEERING MANAGER
PROJECT ENGINEER
QE SUPERVISOR

CONSTRUCTION MANAGER
PROJ SUPT/PROJ CONSTR MANAGER
CHIEF CONSTR QC ENGINEER

DIVISION PROCURENT MGR
PROJ PROCUREMENT MGR
PROCUREMENT SUPPLIER QUALITY MGR AND
DIV SUPPLIER QUALITY MGR

FORMAL REPORT TO CLIENT _____
(If Section II Applies) Date

CORRECTIVE ACTION IMPLEMENTED

VERIFIED BY _____
Project QA Engineer Date

* Describe in space provided and attach reference document.

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DESCRIPTION (continued):

In the event of RCP seal cooler failure, the subject check valves would fail to perform their intended function, thus allowing a combination of pressurized seal injection and reactor coolant to flow back into the CCW system and discharge to the containment atmosphere or auxiliary building, resulting in potentially unacceptable radiation dosage levels for such an event.

128507

Bechtel Associates Professional Corporation

SUBJECT: MCAR 72
128500 Incorrectly Installed Check Valves in the Component
Cooling Water System

FINAL REPORT

DATE: September 15, 1983

PROJECT: Consumers Power Company
Midland Plant Units 1 & 2
Bechtel Job 7220

Introduction

This report provides the final status and course of corrective action required pursuant to MCAR 72.

Description of Deficiency

The original design of the component cooling water (CCW) inlet piping (2-1/2"-1CBB-9,-10,-11, and -12 and 2-1/2"-2CBB-9,-10,-11, and -12) to the reactor coolant pump (RCP) seal coolers shows ten of sixteen 2-1/2-inch, ANSI 1,500-pound, carbon steel nuclear Class 2 check valves in vertical sections of piping with flow upward. The actual valves procured and installed were lift-type check valves.

The concern regards the function of these valves in the event of an RCP seal cooler rupture. This potential rupture could involve a backflow of radioactive coolant that could ultimately breach the reactor coolant pressure boundary through a relief valve in the CCW piping system within the reactor building. In addition, pressurization of the CCW header within the containment may lead to failure of the disk in the ANSI 150-pound carbon steel nuclear Class 2 containment isolation check valve, pressurizing the piping outside containment where further failure could result in loss of high-pressure isolation capabilities.

Summary of Investigation and Historical Background

In the original design of the piping system, check valves 416-2-323, -324, -327, -328, -329, and -330 [Isometric Drawing 7220-M-616, Sh 4(Q)], and check valves 417-2-373, -374, -375, and -376 [Isometric Drawing 7220-M-617, Sh 4(Q)] were located in close proximity to the RCP seals to minimize the distance of potential backflow (2,126 psig and up to 555F) and subsequent heating of the piping system. The valves in question were located in vertical sections of piping with flow upward.

This is an acceptable design condition when using check valves qualified for vertical installation. Upon receipt of the vendor drawings from the valve manufacturer, the holds were removed from the piping isometric drawings to allow fabrication and installation to proceed. It was not noted at that time that the valves purchased were lift check valves that must be located in horizontal piping to operate properly.

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FINAL REPORT 128600

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Analysis of Safety Implication

Because the check valves mounted in vertical runs of piping will not function as intended, the upstream portion of the line would be pressurized and a combination of seal injection (of approximately 2,170 psig at 140F) and reactor coolant (2,126 psig at 555F) may partially backflow into the CCW inlet piping. This combined flow could discharge to the containment atmosphere through a relief valve in the CCW system. Also, the ANSI 150-pound containment isolation check valve could fail, thus permitting backflow into the auxiliary building with no high-pressure isolation capabilities.

The doses for such an event have not been analyzed in the FSAR. Because the resultant doses could adversely affect public health and safety, it is concluded that if this had remained uncorrected, it could have adversely affected the safe operation of the Midland nuclear plant.

Probable Cause

Inattention to details of installation requirements for the check valves during review of the vendor drawings and later in releasing holds on the valves on Piping Isometric Drawings 7220-M-616, Sh 4(Q) and M-617, Sh 4(Q), is the root cause of this problem.

Corrective Action

1. Replacement check valves have been purchased that will function in a vertical run of piping and will be installed in the piping systems in accordance with the revised piping isometric drawings [M-616, Sh 4(Q), Rev 9, issued May 5, 1983, and M-617, Sh 4(Q), Rev 17, issued May 26, 1983] before fuel load in each unit.
2. A review by purchase order to identify all Q-listed check valves that may not function when installed in a vertical run of piping was completed. As a result, only lift check valves and lift-stop check valves procured under Purchase Order 7220-M-118B (Items 6.1, 8.1, 8.2, and 9.3) were identified as a concern and reviewed against the applicable piping isometric drawings. All lift check valves other than those that are the subject of this MCAR were found to be designed in horizontal pipe runs in accordance with vendor requirements. Also, lift-stop check valves were reviewed against the applicable piping isometric drawing and found to be designed in horizontal runs of piping in accordance with vendor requirements.
3. The necessity of reviewing in detail the vendor's installation requirements to ensure equipment will operate as intended has been emphasized to plant design personnel involved in plant layout and piping design (Reference: Com 128166).

Bechtel Associates Professional Corporation

MCAR 72
FINAL REPORT 28600

128507

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Reportability

Based on the safety implications, this deficiency was reported to the NRC in accordance with Title 10 of the Code of Federal Regulations, Part 50.55(e) on September 2, 1983.

Submitted by:



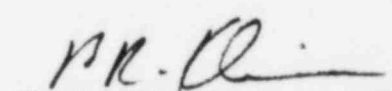
R.F. Tulloch
Plant Design Group
Supervisor

Approved by:



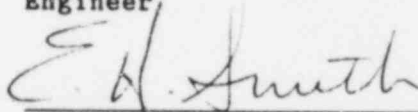
E.M. Hughes
Project Engineer

Concurrence by:



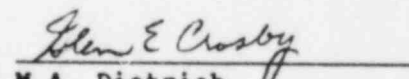
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