Consumers Power Company

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March 18, 1983

81-05 #8

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

MIDLAND NUCLEAR COGENERATION PLANT
DOCKET NOS 50-329 AND 50-330
SHEAR REINFORCEMENT AT MAJOR CONTAINMENT PENETRATIONS
FILE: 0.4.9.53 SERIAL: 20730

References: J W Cook letters to J G Keppler, Same Subject:

(1) Serial 11993, dated May 15, 1981
(2) Serial 12066, dated July 31, 1981
(3) Serial 14635, dated December 14, 1981
(4) Serial 16126, dated March 12, 1982
(5) Serial 17511, dated June 4, 1982
(6) Serial 17598, dated August 31, 1982
(7) Serial 19119, dated December 17, 1982

This letter, as were the referenced letters, is an interim 50.55(e) report concerning the adequacy of shear reinforcements at major containment penetrations.

Attachment 1 provides the final Bechtel report on the actions necessary to assure adequacy of the shear reinforcements at major containment penetrations. The final conclusion is that the as-designed and as-built containment in this regard is satisfactory. The analysis demonstrated that there is no safety problem.

There are some further actions, such as updating FSAR Section 3.8.1.5.1.5 and finalizing the design calculations. In addition, since the analysis mentioned above resulted in revised numerical values for forces, verification of the adequacy of other reinforcements adjacent to the penetrations are being carried out. No adverse findings are anticipated to evolve from the remaining engineering analyses to be completed.

IE07

Consumers Power will send either the final report or another interim report addressing the above issue by June 13, 1983.

James W. Cook

JWC/WRB/1r

Attachment 1: MCAR-51, Revised Final Report, dated March 7, 1983

CC: Document Control Desk, NRC
Washington, DC

RJCook, NRC Resident Inspector
Midland Nuclear Plant

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FPCowan, ASLB Panel
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MMCherry, Esq
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SUBJECT: MCAR 91 (issued 4/21/81)
Shear Reinforcement at Containment Building Major Penetrations

FINAL REPORT

DATE: March 7, 1983

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

Description of Deficiency

The discrepancies discussed in this report concern the amount of radial shear reinforcement provided around the containment building major (large) penetrations.

Summary of Investigation and Historical Background

Background

While examining drawings for the containment shell, it was determined that there is less radial shear tie reinforcement around the equipment hatch, personnel lock, and the emergency air lock penetrations than in other projects of similar design. The design for these penetrations was completed in November 1973, the drawings for the equipment hatch were issued for construction in July 1974, and the containment walls for Units 1 and 2 were constructed in 1976 and 1977.

Investigation

Design requirements, criteria, existing calculations, and drawings were reviewed and it was determined that reevaluation of penetrations for the equipment hatch, main steam line, personnel lock, purge line, and emergency air lock was required.

The equipment hatch penetrations have been independently analyzed using a more detailed finite-element model than that used in the original design. Shear stresses around the equipment hatch satisfy acceptance criteria, which are contained in ASME Section III, Division 2, Subsection CC 3421.6 and are to be incorporated in FSAR Subsection 3.8.1.5.1.5.

The main steam line penetration calculations have been reviewed and the shear reinforcement was found acceptable.

The personnel lock penetration has been independently analyzed using a finite element model as compared to the hand calculations used for the original design. Two 50-degree segments at the top and bottom of the personnel lock penetration were found to be overstressed by the linear elastic analysis for the secondary load case, which includes accident temperature. The results of a cracked section analysis, however, demonstrated that the stresses satisfy the acceptance criteria discussed earlier for the equipment hatch. The cracked section analysis has been independently reviewed and accepted by consultants.

Based on the acceptability of the personnel lock penetration and because the purge line and emergency air lock penetrations have the same shell thickness and reinforcing details and are subject to the same loading conditions as the personnel lock, they are considered acceptable because they have smaller diameters.

Analysis of Safety Implications

No deficiencies have been found under FSAR loading conditions that could adversely affect the safety of the Midland plant.

Corrective Action

As a result of examination of the design criteria, FSAR Subsection 3.8.1.5.1.5 will be revised to include the applicable ASME Section III, Division 2, Subsection CC 3421.6 equations for punching shear in prestressed concrete and to update the finite-element model of the equipment hatch. This will be completed by May 31, 1983. No further corrective action is required as a result of this MCAR.

Probable Cause

Not applicable

Reportability

This condition was reported to the NRC by Consumers Power Company as "potentially reportable" under 10 CFR 50.55(e) on April 17, 1981. Based on the safety analysis of this report, it is concluded that this condition is "not reportable" under 10 CFR 50.55(e).

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