

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

REGION III

Report No. 50-255/79-08

Docket No. 50-255

License No. DPR-20

Licensee: Consumers Power Company
212 West Michigan Avenue
Jackson, MI 49201

Facility Name: Palisades Nuclear Power Plant

Inspection At: Palisades Site, Covent, Michigan
Combustion Engineering, Windsor, Connecticut

Inspection Conducted: May 14-15, and 22-23, 1979 at the site;
May 16, 1979 at Combustion Engineering Office

Inspector: *I. T. Yin*
I. T. Yin

6/4/79

Approved By: *D. H. Danielson*
D. H. Danielson, Chief
Engineering Support Section 2

6/4/79

Inspection Summary

Inspection on May 14-16, and 22-23, 1979 (Report No. 50-255/79-08)

Areas Inspected: Plant seismic modification including (1) review of calculation and pipe analysis, (2) review of installation and inspection procedures, (3) review of QC records, and (4) observation of workmanship. The inspection involved 26 inspector-hours onsite and at the Combustion Engineering office by one NRC inspector.

Results: No items of noncompliance or deviations were identified.

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DETAILS

Persons Contacted

Consumers Power Company (CPC)

*J. Lewis, Plant Superintendent
*K. W. Berry, Technical Superintendent
**G. S. Cashell, Licensing Analyst
*E. T. Wang, Generation Engineer
*G. Petitjean, Technical Engineer
*S. Fox, Senior QA Engineer
*B. Harshe, Senior Engineer

Bechtel Power Corporation (BPC)

J. I. Dotson, Project Manager
*H. M. Vierrao, Construction Superintendent
**D. S. Riat, Section Head, Piping and Stress
*K. Graves, Project Field Engineer
R. Yonekawa, Project Field QC Engineer
K. E. Osborne, Senior Engineer

Combustion Engineering (CE)

**W. D. Meinert, Project Manager
**J. E. Davison, Engineer, Project Office
**R. R. Mills, Licensing Supervisor
**R. Johnson, Analytical Engineer
**T. E. Natan, Engineer, Plant Structures
**D. J. Ayres, Engineer, Plant Structures
**C. C. Chiang, Engineer, Plant Structures

USNRC

**R. D. Silver, NRC/DOR/ORB-2 Senior Project Manager
**J. R. Fair, NRC/EB/DOR Structural Mechanical Engineer

*Denotes those attending exit interview on May 23, 1979.

**Denotes those attending pipe stress meeting at Combustion Engineering on May 16, 1979.

Functional or Program Areas Inspected

1. General

In 1969, Bechtel subcontracted to EDS to perform dynamic analyses on 14 of the large pipe systems. Later, in 1978, Bechtel noticed, while working on the steam generator repair project, that design inconsistencies existed between the systems. Since then, a complete review of all EDS work was performed and it was determined that a number of corrections were needed, including addition of four safety related snubbers to two of the four lines connecting safety injection tanks to the cold legs of the primary loops. The scope of the RIII inspection included review of design documentation, observation of installation, and review of QC inspection records.

2. Snubber Loads and Structural Design Review

The safety injection lines involved are 12" CC4, from Safety Injection Tank #T82D to Cold Leg Loop 2B (North Loop) and 12" CC4, from Safety Injection Tank #T82B to Cold Leg Loop 1B (South Loop). The snubbers added to Loop 2B line are SS-12A and SS-15A. The snubbers added to Loop 1B line are SS-14A and SS-18A.

Design Loading of the snubbers are:

<u>Snubber No.</u>	<u>Normal & Upset (lbs.)</u>	<u>Faulted (lbs.)</u>	<u>Thermal Mvt. (in.)</u>
SS-12A	3,004	6,008	1"
SS-15A	1,523	3,046	1"
SS-14A	3,102	6,204	1"
SS-18A	2,225	4,450	1"

The inspector reviewed Bechtel structural calculation No. 625-4, "Pipe Support, Horizontal Restraints for CC-4-12" Containment Bldg. Hanger 12A, 14A, 15A and 18A," Rev. 0, issued on May 2, 1979, and approved on May 14, 1979, and had no adverse comments. Areas reviewed included (1) deflection criteria, (2) stress levels, (3) weld design, and (4) formula selection.

No items of noncompliance or deviation were been identified.

3. Pipe Stress Analysis Review

The BPC report, "Review and Analysis of Piping Systems Affected by EDS Computer Program Error", dated May 12, 1979, was reviewed by the inspector. The analysis was performed in accordance with ANSI B31.1-1973, Power Piping Code. The inspector checked the maximum pipe stresses and compared them with the Code allowables as follows:

- a. Calculation No. PLS-11, dated May 6, 1979 "Tank 82B to Loop 1B, "BC-1-12," A358, T304 Material
 - (1) Press. + Wt. + OBE = 9,379 psi
(18,720 psi allowed by Code)
 - (2) Press. + Wt. + SSE = 14,068 psi
(37,440 psi allowed by Code)

- b. PLS-11, GC-4-12", A376 T304 Material
 - (1) Press. + Wt. + OBE = 12,150 psi
(14,100 Code)
 - (2) Press + Wt. SSE = 16,425 psi
(28,200 Code)

- c. Calculation No. PLS-12, dated May 6, 1979 "Tank 82D to Loop 2B", GC-1-12", A358 T304 C1.1 Material
 - (1) Press. + Wt. + OBE = 14,527 psi
(18,720 Code)
 - (2) Press + Wt. + SSE = 21,366 psi
(37,440 Code)

- d. PLS-12, CC-4-12", A376, T316 Material
 - (1) Press. + Wt. + OBE = 11,507 psi
(13,440 Code)
 - (2) Press. + Wt. + SSE = 15,973 psi
(26,880 Code)

In regard to the stress levels at the connections of the primary loop cold legs, the BPC representatives stated that the forces and moments were transmitted to CE for approval and a response

letter to a similar condition from CE to BPC, No. P-CE-4498, "Tributary Nozzle Loads", dated December 6, 1978 was presented. The inspector reviewed the letter and noted it where stated, in part, that "All stresses must be appropriate allowables required in the ASME Code Section III for the Class 1 nozzles and Section VIII for Class 3 nozzles" The inspector further noted that (1) the BPC calculations and FSAR requirements are to be in accordance with ANSI B31.1, and questioned why CE gave allowables per ASME Section III definitions, and (2) BPC did not apply stress intensification factors per B31.1 requirements. During a phone conversation, the CE engineers did not feel such a factor is applicable for the primary stress.

In order to resolve above areas, a meeting was held on May 16, 1979, at the CE office in Windsor, Connecticut, with representatives from NRR Project Management, NRR Mechanical Engineering, IE Region III, BPC, and the license present. During the meeting, all parties concurred that (1) the stress intensification at the joint between the run pipe and the branch pipe should be considered for both primary and secondary stresses, (2) the methodology established in ASME Section III to determine the stress intensity indices can be used due to the absence of applicable nozzle configuration provided in ANSI B31.1, and (3) only the highest pipe stress areas were evaluated based on existing available information provided in the CE stress report. As a result of the simplified yet conservative calculation, it was determined that the stress level at the run pipe connection (with intensification factor included) was within the ANSI B31.1 Code allowable.

No items of noncompliance or deviation were identified during the meetings.

4. Work Procedures and Drawing Review

The procedures and drawings for installing safety related snubbers CC-4-12"-12A, CC-4-12"-15A, CC-4-12"-14A, and CC-4-12"-18A were reviewed by the inspector. The documents reviewed included:

- a. Installation drawings and instructions including snubber size (all PSA-3's) and hot and cold position settings.
- b. BPC Welding Procedure, No. P1-ALH, "Shield Metal-Arc Welding of Carbon Steel Using Low Hydrogen Electrodes", Rev. 2, dated October 25, 1978, and the Procedure Qualification Records, PQR-8, dated November 10, 1978.

- c. BPC NDE Procedure, "Visual Examination Specification, VT-ASME", Rev. 0, dated August 12, 1977.

No items of noncompliance or deviation were identified as a result of the review.

5. Review of QC Inspection Records

a. Snubber Installations

Records reviewed included (1) in process QC inspection which consists of core drilling, initial installation, grouting, and adjustments, and (2) final QC inspection.

b. Welding and NDE

Records reviewed included (1) welder qualifications, (2) NDE personnel qualifications, (3) initial fit-up inspection, (4) final weld configuration, and (5) visual examination.

c. Approval of Design Deviations

Field Change Requests (1) No. M-8, dated May 10, 1979, approved May 11, 1979. (2) No. M-18, dated May 16, 1979, approved May 17, 1979, (3) No. M-9, dated May 10, 1979, approved May 12, 1979, (4) No. M-19, dated May 16, 1979, approved May 17, 1979, (5) No. M-15, dated May 12, 1979, approved May 17, 1979, and (6) No. M-13, dated May 11, 1979, approved May 13, 1979.

d. Material Certifications

(1) "Five-Star" grout with Devoider, non-shrink, non-metallic and (2) steel records by Standish Fabrication shop. The Pacific Scientific Company mechanical snubber is fabricated from material qualified to ASME material specifications.

No items of noncompliance or deviations were identified in the records reviewed.

6. Observation of Installation

The inspector was unable to observe the final installation due to immediate plant startup, and he stated that the installations would be observed during the refueling outage in August 1979. In the meantime, the inspector reviewed many photos taken at various angles and positions by the plant engineers, and had no adverse comments.

No items of noncompliance or deviations were identified as a result of the observations.

Exit Interview

The inspector met with site representatives (denoted in the Persons Contacted paragraph) at the conclusion of the inspection on May 23, 1979. The inspector summarized the scope and findings of the inspection noted in this report.