

U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-483/83-23(DE)

Docket No. 50-483

License No. CPPR-139

Licensee: The Union Electric Company
Post Office Box 149
St. Louis, MO 63166

Facility Name: Callaway Plant, Unit 1

Inspection At: Callaway site, Callaway County, MO
Bechtel, Gaithersburg, MD

Inspection Conducted: October 31, and November 1, 1983, and January 9-13,
and January 17-19, 1984

Inspectors: *D. E. Keating*
for R. L. Cilimberg

2/2/84
Date

D. E. Keating
for P. D. Kaufman

2/2/84
Date

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2/2/84
Date

Approved By: *D. H. Danielson*
D. H. Danielson, Chief
Materials and Processes Section

2/2/84
Date

Inspection Summary

Inspection on October 31, and November 1, 1983, and January 9-13, and
January 17-19, 1984 (Report No. 50-483/83-23(DE))

Areas Inspected: As-built walkdown and review of quality and design documents for the chemical and volume control, high pressure coolant injection, containment spray, reactor coolant, and essential service water systems. Also review of quality documents and walkdown of structural steel. The inspection involved a total of 124 inspector-hours onsite by three NRC inspectors. An inspection at the Bechtel office in Gaithersburg, MD involved a total of 30 inspector-hours onsite by two NRC inspectors.

Results: No items of noncompliance or deviations were identified.

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DETAILS

1. Persons Contacted

Union Electric Company

R. Veatch, Supervising Engineer, QA
*C. Plows, Consultant, QA
*H. Millwood, Consultant, QA
*G. Snajder, Lead Auditor, QA
*R. Hamilton, Lead Auditor, QA
J. McGraw, Supervising Engineer
D. Bettenhausen, Liaison Engineer
*H. Stapleton, Engineer
*T. Moser, Assistant Engineer
*W. Weber, Construction Manager
M. Dayne, General Superintendent

Daniels International Corporation

*D. King, Construction Manager
*R. Neal, Project Civil Engineer
*C. Wilson, Senior Engineer, QA
P. Cryderman, Civil QC Engineer
*R. Pitts, Piping Manager
*M. Smith, Audit Coordinator
*M. McCrady, Supervisor
D. Dunning, QA Engineer
T. Bowman, Hanger Engineer
J. Swift, Piping Engineer

Nuclear Projects, Inc.

S. Seiken, QA Manager

Bechtel

*N. Cherish, Plant Design Supervisor
R. Wittman, Site Coordinator
J. Chlapowski, Project Engineer, Design
J. O'Neal, Civil Group Supervisor
L. DiGiacomo, Group Leader
B. Gruber, Assistant Supervisor
L. Jha, Engineering Supervisor
R. Lee, Stress Group Supervisor
L. Rotondo, Project Engineer
J. Milos, QA Engineer
J. Kroehler, QA Manager
P. Dadlain, QA Engineer
A. Lukasik, Quality Engineer

Nuclear Energy Services Inc.

W. Bourassa, Quality Engineer

The inspectors also contacted and interviewed other licensee and contractor employees.

*Denotes those attending the final exit interview on January 13, 1984.

2. Functional or Program Areas Examined

See Sections I, II, and III for the functional and program areas inspected.

3. Exit Interview

The inspectors met with licensee and contractor representatives (denoted in Persons Contacted paragraph) at the conclusion of each portion of the inspection. The inspectors summarized the scope and findings of the inspection noted in this report.

Section I

Prepared by: R. L. Cilimberg
Reviewed by: D. H. Danielson, Chief
Materials and Processes Section

1. Verification of As-Builts

a. General

Four safety-related systems were selected for a review of documentation covering location and identification of piping and welds and a walkdown to ensure that as-built installation is in accordance with documentation. The chemical and volume control, high pressure coolant injection, containment spray, and reactor coolant are the systems selected for this inspection.

b. Procedures

The inspector reviewed the following Bechtel procedures covering installation of the above four systems.

Procedure No. M-204, "Field Fabrication and Installation of Piping and Pipe Supports to ASME Section III"
Procedure No. M-216, "Fabrication of Pipe Supports to ASME Section III"
Procedure No. MS-6, "End Preparation Detail"
Procedure No. MS-7, "End Transition Detail"
Procedure No. MS-9, "Socket Weld and Thread Half/Coupling Detail"
Procedure No. WP-205, "Preparation and Processing of Travelers"
Procedure No. WP-207, "Pipe Bending"
Procedure No. WP-500, "Post Weld Heat Treatment"
Procedure No. WP-502, "Qualification of Welders"
Procedure No. WP-503, "Control of Welding Consumables"
Procedure No. QCP-508, "Visual Inspection of Welds"
Procedure No. WP-504, "Weld Repair"
Procedure No. QCP-200, "Inspection of Fabrication and Installation of Piping"
Procedure No. AP-IX-05, "Material Storage and Control"
Procedure No. AP-VII-10, "Material and Equipment Identification and Inspection Status Control"

Note: Reference to ASME Section III means 1974 Edition through Summer 1975 Addenda

No items of noncompliance or deviations were identified.

2. Chemical Volume and Control System - BG

The inspector reviewed documentation and determined by visual examination that installed piping conformed to applicable drawings, Codes, standards and installation procedures for the following welds and associated piping in the BG system:

Daniel Drawing FSMD-MOS-BG24, Rev. 9

. Weld # FW048	. Weld # FW4
. Weld # FW049	. Weld # FW5
. Weld # FW058	. Weld # FW001
. Weld # FW059	. Weld # FW002
. Weld # FW060	. Weld # FW003
. Weld # FW061	. Weld # FW004
. Weld # FW062	. Weld # FW005
. Weld # FW064	. Weld # FW006
. Weld # FW067	. Weld # FW007
. Weld # FW3	. Weld # FW010

Drawing FSMD-MOS-BG22, Rev. 8

. Weld # FW067	. Weld # F001
. Weld # FW068	. Weld # F002
. Weld # FW069	. Weld # F003
. Weld # FW070	. Weld # F004
. Weld # FW079	. Weld # F005
. Weld # FW007	. Weld # F026
. Weld # F008	. Weld # F027
. Weld # F009	. Weld # F028
. Weld # F025	

Drawing FSM-DMOS-BG23, Rev. 17

. Weld # FW138	. Weld # FW148
. Weld # FW139	. Weld # FW149
. Weld # FW140	. Weld # FW150
. Weld # FW141	. Weld # FW151
. Weld # FW142	. Weld # FW5
. Weld # FW143	. Weld # FW4
. Weld # FW144	. Weld # FW126
. Weld # FW145	. Weld # FW127
. Weld # FW146	. Weld # FW128
. Weld # FW147	. Weld # FW129

No items of noncompliance or deviations were identified.

3. High Pressure Coolant Injection (EM)

The inspector reviewed documentation and determined by visual examination that installed piping conformed to applicable drawings, codes, standards and installation procedures for the following welds and associated piping in the EM system:

Daniel Drawing FSMD-MO3 EM02, Rev. 22

. Weld # FW 61AR2

Daniel Drawing FSMD-M03 EM01, Rev. 31

. Weld # F007	. Weld # F027
. Weld # F008	. Weld # F038
. Weld # F017	. Weld # F046
. Weld # F036R1	. Weld # F052
. Weld # F037	. Weld # F053
. Weld # F026	. Weld # F054R1
	. Weld # F055

Daniel Drawing FSMD MOS EM01, Rev. 5

. Weld # FW13

No items of noncompliance or deviations were identified.

4. Containment Spray (EN)

The inspector reviewed documentation and determined by visual examination that installed piping conformed to applicable drawings, codes, standards, and installation procedures for the following welds and associated piping in the EN system:

Daniel Drawing FSMD-M03 EN01, Rev. 33

. Weld # F030	. Weld # F018
. Weld # F031	. Weld # F017
. Weld # F016	. Weld # F044

Daniel Drawing FSMD-M03 EN02, Rev. 29

. Weld # F017AR1	. Weld # F029
. Weld # FW69	. Weld # F016
. Weld # FW62	. Weld # F030

Daniel Drawing FSMD-MOS EN01, Rev. 7

. Weld # FW002	. Weld # FW001
. Weld # FW003	. Weld # FW029
. Weld # FW004	. Weld # FW030

Daniel Drawing FSMD-MOS EN02, Rev. 9

. Weld # FW001	. Weld # FW065
. Weld # FW062	. Weld # FW066
. Weld # FW063	

No items of noncompliance or deviations were identified.

5. Reactor Coolant (RB)

The inspector reviewed documentation and determined by visual examination that installed piping conformed to applicable drawings, codes, standards and installation procedures for the following welds and associated piping in the RB system:

Daniel Drawing FSMD-MOS 14, Rev. 9

. Weld # FW051	. Weld # FW1
. Weld # FW052	. Weld # FW2
. Weld # FW053	. Weld # FW3
. Weld # FW054	. Weld # FW4
. Weld # FW057	. Weld # FW5
. Weld # FW058	. Weld # FW6
. Weld # FW059	. Weld # FW7
. Weld # FW060	

Daniel Drawing FSMD-MO3 BB14, Rev. 9

. Weld # F002	. Weld # F004
. Weld # F003	. Weld # F005

No items of noncompliance or deviations were identified.

6. The following documentation was reviewed for the systems that were visually examined during the walkdown.

- . Form NPP-1 Reports for Piping Subassemblies
- . Form N-5 Reports for Field Installation of Components, Supports, and Appurtenances
- . Materials Certification - Filler Metal
- . Materials Certification - Piping
- . Weld Identification
- . Welders' Qualification History Records
- . NDE Reports
- . Weld Material Requisitions
- . Welding Procedures/Specifications
- . Welding Procedures Qualification Tests

The inspector reviewed the chemical and physical test results of all materials used in all of the welds and base materials and compared the results to the code requirements and other materials specifications. The test results reported meet the applicable specifications.

No items of noncompliance or deviations were identified.

Section II

Prepared By: P. D. Kaufman
Reviewed By: D. H. Danielson, Chief
Materials and Processes Section

1. As-Built Verification - Program Review

The inspector reviewed the licensee's as-built program for safety-related piping 2-1/2 inches in diameter and greater and to seismic Category I piping, as defined by Regulatory Guide 1.29, "Seismic Design Classification," regardless of size which was dynamically analyzed by computer. Review included elements important to the seismic analysis; pipe run geometry; support and restraint design, locations, function and clearance; and valve and valve operator locations, orientation, and weights.

2. Review of Procedures

The inspector reviewed the procedures indicated below to assure that as-built inputs are properly documented and controlled.

a. The review encompassed the following documents:

Bechtel Procedures

- (1) M-204, Revision 34, "Specification for the Field Fabrication and Installation of Piping and Pipe Supports to ASME Section III."
- (2) M-216, Revision 16, "Specification for the Fabrication of Pipe Supports to ASME Section III."
- (3) "SNUPPS Project IE Bulletin 79-14 Walkdown Procedure," Revision 5.
- (4) "SNUPPS Project IE Bulletin 79-14 Walkdown Pipe Support Inspection Parameters," Revision 2.
- (5) "SNUPPS Project IE Bulletin 79-14 Evaluation Procedure," Revision 2.

Daniel International Corporation Procedures

- (6) QCP-200, Revision 20, "Inspection of Fabrication and Installation of Piping and Component Supports."
- (7) WP-600, Revision 6, "System/Area Punchlist and Walkdown Procedure."
- (8) WP-205, Revision 22, "Preparation and Processing of Travelers."
- (9) WP-200, Revision 22, "Field Fabrication of Safety-Related Piping and Component Supports."

NOTE: Reference to ASME Section III memo 1974 Edition with Addenda through Summer 1975.

This review was to determine if the procedures were consistent with regulatory requirements and licensee commitments; ANSI N45.2.11 - "Quality Assurance Requirements for the Design of Nuclear Power Plants;" Regulatory Guide 1.29, "Seismic Design Classification;" IE Bulletin 79-14, "Seismic Analysis for As-Built Safety-Related Piping Systems."

Within the areas inspected, no violations or deviations were identified.

3. Safety-Related Piping System Walkdown

- a. Walkdown Packages were selected from five safety-related systems: Reactor Coolant (BB); Chemical and Volume Control (BG); Essential Service Water (EF); High Pressure Coolant Injection (EM); and Containment Spray (EN).

The following as-built design and construction drawings were reviewed in the walkdown packages:

- (1) M-03 - Piping Isometrics
- (2) M-05 - Hanger Location Drawings (Large Pipe)
- (3) M-09 - Hanger Location Drawings (Small Pipe)
- (4) M-06 - Hanger Drawings and Index
- (5) M-08 - Hanger Detail Drawings (Small Pipe)

The inspector verified the contents of the Walkdown Packages against the Walkdown Summary Sheets for completeness of design documents, including title, identification number, revision, and date, which were sources of input information for the seismic analyses.

- b. The inspector compared the actual installation of the above mentioned safety-related piping systems with the final detailed construction drawings to determine whether final design drawings reflected as-built conditions for each Walkdown Package indicated below.

- (1) Walkdown Package #12 (BG System)
- (2) Walkdown Package #27 (BB System)
- (3) Walkdown Package #34 (EF System)
- (4) Walkdown Package #38, 39 & 40 (EM System)
- (5) Walkdown Package #46 (EN System)

- c. Sample portions of the above Walkdown Packages were reviewed by the inspector to determine the accuracy of as-built documentation input for engineering evaluation and seismic analyses:

Walkdown Package #12 - M-23BG24(Q) Rev. 0
 M-05BG24(Q) Rev. 5
 M-09BG24(Q) Rev. 3
 O-BG24-H002 Rev. 1
 O-BG24-R003 Rev. 1
 O-BG24-R004 Rev. 1
 O-BG24-R013 Rev. 2

Walkdown Package #27 - M-03BB14(Q) Rev. 5
 M-05BG24(Q) Rev. 5
 M-09BG24(Q) Rev. 3
 O-BB14-R006/232(Q) Rev. 1
 O-BB14-R007/232(Q) Rev. 2
 O-BB14-C004/232(Q) Rev. 1

Walkdown Package #34 - M-03EF08(Q) Rev. 3
 M-05EF08(Q) Rev. 4
 O-EF08-C006/511(Q) Rev. 0
 O-EF08-C007/511(Q) Rev. 0
 2-EF08-R004/511(Q) Rev. 0

Walkdown Package #38 - M-23EM01(Q) Rev. 0
 M-05EM01(Q) Rev. 5
 O-EM01-C010(Q) Rev. 3
 O-EM01-H001(Q) Rev. 2

Walkdown Package #39 - M-23EM02(Q) Rev. 0
 M-05EM02(Q) Rev. 2
 M-09EM02(Q) Rev. 3
 O-EM02-C013/134(Q) Rev. 4
 O-EM02-C014/134(Q) Rev. 1

Walkdown Package #40 - M-03EM12(Q) Rev. 6
 M-05EM12(Q) Rev. 6
 M-09EM12(Q) Rev. 3
 O-EM12-C533/231(Q) Rev. 0
 O-EM12-R013/232(Q) Rev. 2

Walkdown Package #46 - M-23EN01(Q) Rev. 0
 M-25EN01(Q) Rev. 4
 M-09EN01(Q) Rev. 3
 O-EN01-C009(Q) Rev. 1

Within the areas inspected, no violations or deviations were identified.

4. Verification of Seismic Stress Analysis

A review was conducted at the Bechtel, Gaithersburg office to verify that the (ME-101) seismic stress analysis input information conformed to the actual as-built configuration of the safety-related systems identified in Paragraph 3.c. above.

Within the areas inspected, no violations or deviations were identified.

Section III

Prepared by: D. E. Keating
Reviewed by: D. H. Danielson, Chief
Materials and Processes Section

1. Documents Reviewed

A review of the following documents was performed:

- . Specification No. 10466-C121(Q), Revision 12, Technical Specification for Purchase of Structural Steel for SNUPPS
- . FGR 2FC-1575-C, Revision 8, Allowing interchange of A307, Grade A and A307 Grade B bolts in civil applications identified in above Bechtel Technical Specifications
- . Specification No. 10466-C122(Q), Revision 13, "Technical Specification for Contract for Erection of Structural Steel for SNUPPS"
- . QCP-113, Revision 12, "Erection of Safety-Related Structural Steel"
- . ECP-507, "Inspection of Structural and Miscellaneous Steel Safety-Related Welding"
- . Specification No. 10466-C202(Q), "Erection of Pipe Whip Restraints, Pipe Whip Restraint Embeds, and NSSS Support Embeds"
- . Construction Procedure WP-212, Revision 6, "Field Fabrication and Installation of Pipe Whip Restraints"
- . Bechtel Drawing C-03AB50(Q), Revision 5, "Pipe Whip Restraints, Main Steam," Sht. 1
- . Bechtel Drawing C-03AB51(Q), Revision 6, "Pipe Whip Restraints, Main Steam," Sht. 2
- . Bechtel Drawing C-03AB52(Q), Revision 6, "Pipe Whip Restraints, Main Steam," Sht. 3
- . Bechtel Drawing C-03AB54(Q), Revision 4, "Pipe Whip Restraint, Main Steam," Sht. 4
- . QCP-109, "Concrete Placement, Grouting, and Post-Pour"
- . WH-100, "Installation of Post-Pour Embedded Items"

This review compared the requirements of these documents to the requirements of the licensee's PSAR; the 7th edition of the Steel Construction Manual of the American Institute of Steel Construction (AISC); the American Welding Society Code (AWS) D1.1, 1975 edition and AWS A5.20, 1969,

Specification for Mild Steel Electrodes for Flux-Cored Arc Welding; the American National Standards Institute (ANSI) Standard 45.2.5, 1974, Supplementary Quality Assurance Requirements for Installation, Inspection, and Testing of Structural Steel During Construction; and ANSI N45-2.6, 1973, Qualification of Inspection, Examination, and Testing Personnel for the Construction Phase of Nuclear Power Plants.

This review also determined that the applicable NRC requirements had been met.

Based upon this review, no items of noncompliance or deviations were identified.

2. Walkdown of Structural Steel and Main Steam Generator Whip Restraints and Tower Supports

- a. A walkdown of the reactor building structural steel was conducted. It was determined that the structural steel in the selected areas was of the size and grade called for on the framing drawings.

The bolted connections complied with the provisions of AISC. Additionally, the bolted connections for the structural framing members appeared to meet the specification and manufacturer's requirements for load indicating washers.

- b. A walkdown of the stub beams attached to the outer wall of the containment was performed. Items inspected were the expansion bolts, welding of bearing plates to main framing members, relationship of shim plates to bearing plates and stub beam flanges.

The expansion bolts were checked for freedom of movement, that the proper number of bolts were used at each connection, that the proper number of washers were used for each bolt, and that the nuts and jamb nuts were at least finger tight per AISC definition. These conditions were in accordance with the specifications listed in paragraph 1 above.

The welding of the bearing plates to the main beam flanges was in accordance with specifications listed in paragraph 1 above and the applicable sections of AWS D1.1-1975.

The final review of the Quality Control (QC) records will be made by the NRC Resident Inspector after QC has made a final inspection of these items.

- c. A walkdown of two (2) Main Steam Generator Support Towers was performed. The same items of interest were inspected as in 2.a. and 2.b. above. These items, also, met the requirements of the erection specifications and applicable codes listed in paragraph 1 above.

Based upon this walkdown, no items of noncompliance or deviations were identified.