U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-456/85023(DRP); 50-457/85024(DRP)

Docket Nos. 50-456; 50-457 Licenses No. CPPR-132; CPPR-133

Licensee: Commonwealth Edison Company
Post Office Box 767
Chicago, IL 60690

Facility Name: Braidwood Nuclear Power Station, Units 1 and 2

Inspection At: Braidwood Site, Braidwood, Illinois

Inspection Conducted: May 9 through June 21, 1985

Inspectors: R. D. Schulz

L. G. McGregor

W. J. Kropp

R. N. Gardner

Approved By: W. S. Little, Director
Braidwood Project

7/10/85
Date

Inspection Summary

Inspection on May 9 through June 21, 1985 (Report No. 50-456/85023(DRP); 50-457/85024(DRP))
Areas Inspected: Routine, unannounced safety inspection of activities with regard to licensee action on previous inspection findings, plant tours, pipe supports, high strength bolting, surveillances, bolted flange connections, piping (small bore) as-built drawings, HVAC installations, hydrostatic tests, corrective action programs, and electrical installations. The inspection consisted of 315 inspector-hours onsite by four NRC inspectors, including 32 inspector-hours onsite during off-shifts.
Results: Of the eleven areas inspected, no items of noncompliance or deviations were identified in ten areas, one item of noncompliance was identified in the remaining area: failure to control the storage and preservation of material and equipment (paragraph 3).

DETAILS

1. Persons Contacted

Commonwealth Edison Company (CECo)

*M. Wallace, Project Manager
*C. Schroeder, Licensing and Compliance Superintendent
*D. Shamblin, Construction Superintendent
*T. Quaka, Quality Control Supervisor
*W. Vahle, Engineering Manager
S. Hunsader, Quality Assurance Supervisor
G. Fitzpatrick, Assistant Manager Quality Assurance Corporate
E. Netzel, Quality Assurance Supervisor
*L. Kline, Licensing and Compliance Supervisor
P. Hoffman, Engineer
C. Gray, Project Construction Supervisor
D. Skoza, Engineering Supervisor
*J. W. Gieseker, Engineer
M. Gorski, Engineer
M. Curinka, Engineer
K. Miller, Quality Assurance Engineer
*D. Boone, Project Construction Field Engineer
*G. F. Marcus, Project Management
*C. Tomashek, Startup Superintendent
*D. Cecchett, Licensing and Compliance
*C. Allen, Project Construction
*E. Wendorf, Project Engineering
*J. Williams, Quality Assurance Inspector
*J. Phelan, Project Engineering
*H. Zimmerman, Startup Testing Supervisor

Phillips Getschow Company (PGCo)

*T. O'Connor, Site Manager
*K. Kranz, Quality Assurance Site Manager
*J. Stewart, Project Engineer
G. Galloway, Assistant Project Engineer
G. James, Quality Assurance Engineer
R. Hamilton, Welding Supervisor
S. Forbes, Quality Assurance Coordinator

G. K. Newberg Company

*D. Craven, Project Manager
D. Maxwell, Project Engineer
*R. Donica, Quality Assurance Manager
P. Struckholz, Engineer

L. K. Comstock and Company, Inc. (LKC)

*R. Seltmann, Quality Assurance Manager

*I. Dewald, Quality Control Manager
L. Seese, Assistant Quality Control Site Manager
*T. Rolan, Project Manager
*J. J. Klena, Project Engineer

Pittsburgh Testing Laboratory

R. B. McCollough, Quality Control Inspector
F. Forest, Site Manager
L. White, Quality Control Inspector

Sargent and Lundy (S&L)

*K. Fus, Assistant Over-Field Coordinator
*L. Jacquet, Structural Project Engineer

The inspectors also contacted other licensee and contractor personnel, including craftsmen, and technical and engineering staff members.

*Denotes those attending the exit meeting on June 21, 1985.

2. Licensee Action on Previous Inspection Findings

a. Unresolved Items

(Closed) 456/84-42-02; 457/84-38-02: Programmatic deficiencies in Instrumentation Retrofit Verification Program. The Retrofit program was revised on March 12, 1985 by Procedure QCP-B32. The revision included the requirement that all unacceptable conditions be documented on a "Field Problem Report" in accordance with procedure PGCP 1.1. In addition, the issuance of uncontrolled drawings for retrofit inspection was eliminated. The drawings used for inspection purposes are required to be "Retrospection" documents which include the latest design data and are checked by engineering personnel other than those preparing the documents. Processing of "Field Problem Reports" will be the subject of future NRC inspections.

b. Open Items

(Closed) 456/84-31-01; 457/84-29-01: Inadequate procedural controls for temporary pipe supports. On January 24, 1985, the licensee issued Construction Guidelines for Temporary Supports to all site management personnel. Examples of the measures delineated in the January 24 correspondence are stated below:

"It is allowable to use installed and permanently supported piping for the following purposes with the listed restrictions and precautions.

a. Temporary support for other piping up to 2 pipe diameter sizes larger for piping greater than 4" diameter. For 4" and smaller diameter piping temporary support only same size or smaller size piping.

Restrictions/Precautions

No concentrated loads are to be located in close proximity to in-line flanges, valves, equipment nozzles, etc. Do not attach temporary supports (i.e. cable, etc.) directly to permanent supports. Temporary supports must be installed every:

7-10 ft. maximum - 2" diameter piping
10-15 ft. maximum - 2 1/2" diameter - 4" diameter piping
15-25 ft. maximum - 6" diameter - 12" diameter piping
30 ft. maximum - 14" diameter piping

Temporary supports should be installed so the location dimensions of the supporting pipe is not altered.

Tops of electrical panels and cabinets, instrument panels or racks and rotating equipment should not be used as scaffolding support points."

In the last few months there has been a definite improvement in the use of temporary supports. This area will be subject to future inspections to determine continued compliance with the January 24, correspondence.

(Closed) 456/84-17-04; 457/84-17-04: Flange bolt-up documentation deficiencies. The procedure for implementing a Mechanical Joint Retrofit Program, PGCP-46 was reviewed by the NRC and found to be ambiguous with regard to the visual inspections to be performed. The procedure was subsequently revised on April 22, 1985 and specifically designated the mechanical joints that required retrofit, visual inspections, and documentation reviews. The procedure is being adequately implemented and is identifying for rework those mechanical joints whose condition is in question. Attributes to be checked include cleanliness of joint faces, damage to bolting material, lubrication of bolting threads, and proper thread engagement including loose hardware.

3. Plant Tours

The inspector observed work activities in progress, completed work, and plant status during general inspections of the plant. Observation of work included blockwall column modifications, high strength bolting, instrument piping, safety related pipe welding, anchor bolts, structural welds, HVAC welding, and cable trays in the containment and auxiliary buildings. Particular note was taken of material identification, nonconforming material identification, and housekeeping. Craft personnel were interviewed in the work areas.

Junction box, 1JB1611A, was found removed from its mounting. It was determined that this junction box was being controlled by rework No. 1794. Also, several cables installed in conduit were noted as not being terminated at one end. The inspectors verified through the review of documentation that these cables had not yet been terminated by the electrical contractor and therefore, did not represent an unauthorized rework. The inspectors noted no unauthorized removal of electrical equipment/items during plant tours.

The inspectors noticed a strap for conduit, C1A1403, missing. This conduit is located in the auxiliary building at approximately location W-15 at the 390' elevation. The conduit was routed from junction box 1JB542A to valve 1CV8105. A review of documentation revealed that this conduit was previously inspected and accepted by the electrical contractor on January 16, 1984. The electrical contractor issued Inspection Corrective Action (ICR) 10235 to document this deficiency. As a result of this missing conduit strap the inspector selected several recently inspected conduits to verify proper installation. The results are noted in the electrical section of this report. Since no other missing straps were noted during further tours of the plant and the conduits specifically selected for inspection during this reporting period were found to be satisfactorily installed, the inspector considers the missing strap on conduit C1A1403 as an isolated case. However, this area will be closely monitored in future inspections.

During the tours of the plant, unsatisfactory housekeeping activities were noted in cable tray cleanliness and the control of high strength bolting material.

The following cable trays, with cable installed, were noted as having debris:

1618F - nails, washers, bolts
1318M - nails
11521M - wire
11803J - wire, sharp metal
21753J - screws, wire, broom
21653J - metal brackets
21609J - grinding wheel, screws

The upper cable spreading room was noted as having debris in cable trays (e.g., nails) and empty aerosol cans which had contained a highly flammable liquid.

With regard to the control of high strength bolting material which cannot be reused, the following areas had high strength bolts which were not within a material staging area:

. Area V-12, elevation 467' - A490 bolts were noted on the floor without being identified as to their material status (i.e. scrap, acceptable for installation etc.).

- Containment Building Unit 1, R-11 elevation 450' - A325 galvanized bolts not identified as to their material status.

- Containment Building Unit 2, Polar Crane - A490 bolts not identified as to their material status.

The threads on the A325 and A490 bolts did not appear damaged or upset to prevent use.

The debris in cable trays, empty pressurized cans in the upper cable spreading room, and the lack of control of high strength bolting material in various areas of the plant are considered to be examples of a violation of 10 CFR 50, Appendix B Criterion XIII (456/85023-001; 457/85024-001). The licensee has initiated immediate action to correct these conditions.

The NRC inspector identified two loose bolts on structural tube steel to beam connection MS-47. This deficiency was brought to the attention of the structural contractor G. K. Newberg and subsequent evaluation by the structural contractor revealed that the tube steel was installed with the ends reversed. The end of the tube steel that was required to be bolted to the beam was welded and the end that was required to be welded was bolted to the beam. Newberg documented these deficiencies on nonconformance report number 213-1154 and issued a structural steel installation traveler, number 7619, to correct the installation. Further inspection by the NRC and Newberg identified an Engineering Change Notice, No. 2495, dated March 26, 1982, which required that this connection be reinspected as a result of axial lengthening criteria problems concerning sliding connections. MS-47 is a sliding (bolted) connection. The Engineering Change Notice was open due to forthcoming inspections and planned rework. Therefore, based on the Engineering Change Notice and measures established to correct the MS-47 installation this issue is considered closed.

The NRC inspectors also found a loose bolt on A196B1 beam to embed connection in Containment No. 1. The structural contractor was notified. Subsequently a nonconformance report, No. 1522, was issued to document the loose bolt and a structural steel installation traveler, No. 7448, was issued to replace all the bolts in the connection, including tightening each bolt to the required torque value. Upon removal of the bolts the structural contractor discovered that the beam bolt holes had been torch cut. Torch cutting is not an acceptable practice unless allowed by the design engineer based on engineering analysis. The AISC Code states that holes may be punched, subpunched and reamed, or drilled. The A196B1 beam was installed by Napolean Steel Contractors. This issue will remain unresolved pending both Sargent and Lundy review of the acceptability of this connection, (taking into consideration the loose bolt and the torch cut holes), and licensee evaluation of torch cutting practices by Napoleon Steel and the generic application to other connections (456/85023-002; 457/85024-002).

While touring the upper cable spreading rooms, Unit 1 and Unit 2 the NRC inspectors noticed numerous small holes in HVAC ducts which were being filled with sealant. Subsequent inspection revealed that although the sealant was an approved product adequate procedures had not been established for repairing holes in the HVAC ducts caused by the removal of insulation. The inspector reviewed Pullman Construction Industries, Inc., Procedure, B5.1.F, Revision 3, HVAC Repair/Adjustment Procedure, which stated in Section IV A. Repair:

> "A Small Hole - Shall be tack welded or a sheet metal screw surrounded by an approved sealant shall be installed in the hole and on immediate area of interest.
>
> A Large Hole - Shall have a bolt, nut and washer installed on both sides of metal with approved sealant between and on immediate area of interest."

Size was not defined for large holes or small holes, nor the maximum size of the hole to be filled with sealant. Therefore, it was difficult to determine the appropriate or adequate repair method. Furthermore, the number of holes allowed in a duct or sectional area was not defined by Sargent and Lundy drawing M-1261, Revision K, or specified in procedures or instructions.

On May 30, 1985, the HVAC contractor, Pullman issued a stop work order stating:

> "The method of repairing of holes in sheet metal by use of sheet metal screws or bolt, nut, and washer and sealant only, is hereby directed to be stopped."

On May 31, 1985, Pullman issued a memorandum to production personnel stating that holes up to 1/8 inch in diameter may be repaired with sealant.

Pullman is in the process of revising their procedures delineating the acceptable repair processes, including defining hole sizes and corresponding approved repair techniques. This issue will remain unresolved pending procedure revisions and licensee analysis of any required reinspections, based on past repair practices in relation to hole size and safety significance (456/85023-003; 457/85-024-003).

The NRC inspectors discovered two loose nuts for an electrical, auxiliary steel, bolted connection. The auxiliary steel is for hanger CC-30 on drawing 20E-1-3547. It is located in Unit 1 Containment, at column R-1, at elevation 412'. The connection, per drawings 20E-1-3547A and 20E-0-3393H, is classified as Category I. The FSAR, Amendment 39, defines this category as including those structures, systems, and components whose safety function is to retain their own integrity and/or not constitute a hazard to other safety Category I structures, systems, and components.

Further review by the NRC inspectors disclosed that Category 1, seismic non-safety related, electrical bolted connections are not being inspected by personnel independent of cost and schedule. These connections are being inspected by production personnel responsible for installation activities. Although quality control inspectors are not inspecting bolted connections, they are inspecting Category I, seismic non-safety related welded connections. This policy of not inspecting electrical bolted connections does not appear to be in conformance with the commitments stated in the FSAR, Section 3.2, Amendment 39 or Regulatory Guide 1.29, to which the licensee committed in Amendment 37 of the FSAR. Both Section 3.2 of the FSAR and Regulatory Guide 1.29 Seismic Design Classification, invoke the quality assurance requirements of 10 CFR 50, Appendix B, Criterion X, which requires that an inspection program be established. This issue is considered unresolved pending licensee evaluation and subsequent NRC review, including the apparent need for an inspection program to assure that any additional deficient bolting is identified. The safety significance of the loose bolts found on the auxiliary steel and any loose bolts identified in a licensee implemented inspection program will be examined by the NRC in order to determine whether this item will be ultimately classified as a violation or deviation (456/85023-004; 457/85024-004).

The inspector examined Category 1, seismic non-safety related, instrument supports and determined that both welded and bolted connections are being inspected by quality control inspectors.

4. Pipe Supports

Seventeen pipe supports were examined for compliance to Sargent and Lundy Specification F/L-2739, drawings, and Phillips Getschow Co. Procedure, QCP-B23, "Installation and Inspection of Component Supports." The supports inspected and their system identification are as follows:

Pipe Support	System	Location
1SX03001X	Essential Service Water	Auxiliary Building - Unit 1
1CV54004X	Chemical and Volume Control	Auxiliary Building - Unit 1
1SX39032T	Essential Service Water	Auxiliary Building - Unit 1
1FP11021X	Fire Protection	Auxiliary Building - Unit 1
1SX36002X	Essential Service Water	Auxiliary Building - Unit 1
1AB15001R	Boric Acid Proc.	Auxiliary Building - Unit 1
1FP11040	Fire Protection	Auxiliary Building - Unit 1
1AB15003X	Boric Acid Proc.	Auxiliary Building - Unit 1
1AB16001R	Boric Acid Proc.	Auxiliary Building - Unit 1
1AB16025R	Boric Acid Proc.	Auxiliary Building - Unit 1
1AB11019R	Boric Acid Proc.	Auxiliary Building - Unit 1
1CV102007G	Chemical and Volume Control	Containment - Unit 1
1CV23012S	Chemical and Volume Control	Containment - Unit 1
1CV102002G	Chemical and Volume Control	Containment - Unit 1
1CC24017R	Component Cooling	Containment - Unit 1
1CC23018R	Component Cooling	Containment - Unit 1
1CC23032X	Component Cooling	Containment - Unit 1

The supports were installed in compliance with the specification, drawings, and procedure. Attributes examined included welding, location, dimensional tolerances, material identification, welder identification, and configuration. In addition, concrete expansion anchor installations were inspected for compliance with Sargent and Lundy Specification BY/BR-CEA.

Pipe support 1SX03001X contained a 3/4" thick carbon steel plate that had numerous laminations. These laminations had been identified by a Phillips Getschow Co. quality control inspector and the nonconforming condition was documented on nonconformance report No. 1438 dated April 2, 1984. This issue is considered closed based on the documented identification of the condition.

No violations or deviations were identified.

5. High Strength Bolting

Numerous 7/8" diameter, ASTM A-325 high strength, structural steel bolting connections were re-torque tested at the request of the inspector. The torque testing was witnessed by a Commonwealth Edison representative.

G. K. Newberg Company installed numerous structural steel items by using the turn-of-the-nut method. Napoleon Steel Contractors, Inc. installed numerous structural steel items by using the calibrated torque wrench method. Both methods are acceptable per the AISC specification for structural joints using ASTM A-325 or A-490 Bolts. The installed bolting inspection records were reviewed, and the bolts that were originally tightened by the calibrated torque wrench method were documented as having installation torque values of 530 to 620 ft-lbs. The inspection records represented ten percent of the bolts in a connection, but never less than two. Before re-torque testing the installed bolts, Pittsburgh Testing Laboratory tested three bolts in a tension device and determined a torque-tension relationship for the 7/8" bolt diameter as stated in Sargent and Lundy Specification, F/L-2735, "Structural Steel." The torque- tension relationship was 530 ft-lbs. Therefore, based on the original values of 530 to 620 ft-lbs. documented in the inspection records and the 530 ft-lbs. determined in the torque tension relationship, the NRC inspector expected to find high strength bolting installation torque values in the range of 475 to 620 ft-lbs. This range is based on 5 to 10% relaxation allowances, as stated in the AISC Structural Code, "Commentary for Structural Joints Using ASTM A-325 or A-490 bolts."

The 7/8" bolts examined and their re-torque values are listed below:

Connection	No. of Bolts Tested/ Re-torque ft-lbs.	Contractor/Method of Installation
Beam 164B1 to embed plate	3/530 530 530 (Total Bolts In Connection - 5)	Napolean/Calibrated Torque Wrench

Connection	No. of Bolts Tested/ Re-torque ft-lbs.	Contractor/Method of Installation
Beam 164B1 to column 189R13	5/530 530 530 530 530 (Total Bolts In Connection - 9)	Napolean/Calibrated Torque Wrench
Beam 164B4 to embed plate	2/530 530	Napoleon/Calibrated Torque Wrench
Beam 168B2 to column A152R11	*3/150 100 75 (Total Bolts In Connection - 9)	Newberg/Turn-Of-The-Nut
Beam 132B1 to embed	7/530 530 530 530 530 530 530 (Total Bolts In Connection - 8)	Napoleon/Calibrated Torque Wrench
Beam 133B3 to embed	*4/530 550 350 450	Napoleon/Calibrated Torque Wrench
Beam 1341B to embed	4/530 530 530 530	Napoleon/Calibrated Torque Wrench
Beam 102B1 to column A101R18	6/530 530 530 530 530 530	Napoleon/Calibrated Torque Wrench
Beam 102B2 to column A111C1	*4/530 530 530 150 (Total Bolts In Connection - 6)	Napoleon/Calibrated Torque Wrench

Connection	No. of Bolts Tested/ Re-torque ft-lbs.	Contractor/Method of Installation
Beam 128B1 to column A111C5	3/530 530 530 (Total Bolts In Connection - 4)	Napoleon/Calibrated Torque Wrench
Beam 128B1 to column A113C1	*5/530 530 530 490 430 (Total Bolts In Connection - 8)	Napoleon/Calibrated Torque Wrench
Beam 130B2 to embed	2/530 530 (Total Bolts In Connection - 3)	Napoleon/Calibrated Torque Wrench
Beam 130B1 to embed	3/530 530 530	Napoleon/Calibrated Torque Wrench
Beam 102B1 to column A113C1	3/530 530 530	Napoleon/Calibrated Torque Wrench
Beam 132B1 to embed	*6/100 370 450 550 600 370 (Total Bolts In Connection - 8)	Napoleon/Calibrated Torque Wrench
Beam 132B1 to column A101R18	9/530 530 530 530 530 530 530 530 530 (Total Bolts In Connection - 10)	Napoleon/Calibrated Torque Wrench

Connection/Report No.	No. of Bolts Tested/ Re-torque ft-lbs.	Contractor/Method of Installation
Blockwall Column/ 2AB-7N	2/530 530	Newberg/Turn-of-The-Nut
Blockwall Column/ 2AB-3N	4/530 530 530 530	Newberg/Turn-of-The-Nut
3.6AB4N/SB-2375 page 6	*3/480 100 160	Newberg/Turn-of-The-Nut
3.6AB34N/SB-2375 page 4	*3/230 320 200	Newberg/Turn-of-The-Nut
4AB31N/SB-2375 page 5	*3/380 180 300	Newberg/Turn-of-The-Nut
4AB31N/SB-2375 page 3	2/530 530	Newberg/Turn-of-The-Nut
4.3AB43N/SB-2375 page 2	*3/220 330 330	Newberg/Turn-of-The-Nut
SSIT7205/SB-2468 page 1	*3/280 300 320	Newberg/Turn-of-The-Nut
4AB31N/SB-2375 page 1	*3/550 420 400	Newberg/Turn-of-The-Nut
SSIT5628/SB-2401 page 1	*14/100 530 530 530 530 530 530 530 530 530 530 530 530 530	Newberg/Turn-of-The-Nut

Connection/Report No.	No. of Bolts Tested/ Re-torque ft-lbs.	Contractor/Method of Installation
DCT394/SB-2400 page 1	*4/500 260 250 550 (Total Bolts In Connection - 8)	Newberg/Turn-of-The-Nut
DCT412/SB-2467 page 1	3/400 550 550	Newberg/Turn-Of-The-Nut

A 530 ft-lb. torque value recorded by the inspector represented a torque at which the bolts did not turn. Therefore, the bolts were torqued to a higher value than the 530 ft-lbs. The other bolts turned at the value reported. The number of bolts tested equals the number of bolts in each connection unless otherwise indicated. The connections with an asterisk indicate a need for an analysis by the licensee to determine acceptability. The mean value of the readings taken at 530 ft-lbs. or below for the calibrated torque wrench installation method was 490 ft-lbs. while the value for the turn-of-the-nut method was 421 ft-lbs. Additionally, the turn-of-the-nut installation torque values were subject to greater fluctuations.

Licensee determination of the acceptability of the connections re-torque tested and evaluation of the implementation of the turn-of-the-nut installation method, is considered an open item subject to NRC review (456/85023-005; 457/85024-005).

No violations or deviations were identified.

6. Surveillances

Surveillances performed by the piping contractor were reviewed with regard to identification of deficiencies, corrective action, and overall effect of improving quality performance. The following surveillances were reviewed:

Surveillance No.	Subject	Date
263	Indoctrination and Training	09/13/84
327	Stores Request	10/12/84
183	Certification of Inspectors	08/09/84
272	Certification of N.D.E. Personnel	09/14/84
325	Large Bore Piping	10/10/84
460	Equipment	12/26/84
003	Bolted Connections	04/04/84

The NRC found the surveillances to be effective. Although surveillances by definition are limited in scope, they identified quality related deficiencies and initiated corrective action to prevent repetition, including identifying deficient procedures which were subsequently revised. The surveillance findings were also trended and graphed forming a basis for increasing surveillances or audits in a specific area.

No violations or deviations were identified.

7. Bolted Flange Connections

Six bolted flange connections, installed by the piping contractor, were examined. The inspector checked for correct component identification, flange location as detailed on the approved drawing, proper centering of the gasket, and that the joint was properly tightened. Documentation reviews included the piping quality control inspection records. Quality control hold points had been established and witnessed for the following installation check points:

- Component Identification
- Internal Cleanliness
- Joint Faces Clean
- Bolting Material Male/Female Inspected For Damage
- Correct Bolting/Gasket Material Used and Recorded
- Threads Lubricated and Lube Type Entered
- Flange Surface Parallel Measurement Recorded Prior to Bolt-Up
- Gasket Properly Centered
- Joint Properly Tightened

The flanges were furnished in accordance with the design specification for size, type, and rating. Two of the flanges were bolted to valves and the NV-1 Code Data Reports were found to comply with the design specification. Certifications for the flange nuts and bolts met the requirements of the ASME Boiler and Pressure Vessel Code, Section II and Section III.

The flanges which the NRC inspector examined are detailed below:

Joint Identification	System/Unit I	Size
AB-26-F-1-1	Boric Acid Proc.	3" 150 lb.
AF-13-F-1-1	Auxiliary Feedwater	4" 900 lb.
AB-25-F-1	Boric Acid Proc.	4" 150 lb.
AF-13F-3-1	Auxiliary Feedwater	4" 900 lb.
AF-13F-2-1	Auxiliary Feedwater	4" 900 lb.
SX-6F-15	Essential Service Water	30" 150 lb.

The inspector discovered that the 30" Essential Service Water flange was not physically identified as SX-6F-15 on the flange. Further inspection revealed that the Essential Service Water flanges had been marked in the early years of construction with different identification numbers than are currently documented on the drawings. Furthermore, original installation inspection records for the Essential Service Water

flange, SX-6F-15, could not be traced to SX-6F-15, due to the different identification numbers which did not appear on obsolete drawings. Subsequent NRC documentation reviews disclosed that this lack of traceability for flange SX-6F-15 had been identified by the piping contractor under the scope of the Mechanical Joint Retrofit Program, PGCP-46, Revision 0. The applicable installation inspection hold points would be reverified under the scope of PGCP-46.

Due to the adequacy of the Mechanical Joint Retrofit Program, which identified this deficiency for corrective action, this issue is considered closed.

No violations or deviations were identified.

8. Piping (Small Bore) As-Built Drawings

Small bore is defined as less than or equal to 2" diameter piping. Six installed small bore piping runs were examined for conformance to the as-built drawing. The NRC inspectors' walkdown included the following check points:

- dimensional conformance
- configuration
- location (elevation)
- material identification (heat traceability)
- welder identification (physical marking)

The piping runs are detailed on the following drawings:

Unit 2 - M-2544A, Sheet 131 - Essential Service Water
Unit 1 - M-2552C, Sheet 20 - Steam Generator Blowdown
Unit 1 - M-2552C, Sheet 12 - Steam Generator Blowdown
Unit 1 - M-2552C, Sheet 21 - Steam Generator Blowdown
Unit 1 - M-2536C, Sheet 8 - Main Steam
Unit 1 - M-2536C, Sheet 6 - Main Steam

Drawing M-2552C, Sheet 12, was inspected from penetration P-90 to the missile barrier wall at 1RB-207.

The associated documentation for the small bore piping lines was examined and found to be in compliance with the ASME Boiler and Pressure Vessel Code, Section II, III, IX, and regulatory requirements. Records checked included:

- welding procedure qualifications
- welder qualifications
- certified material test reports (components and weld rod)
- fit-up and final visual inspection documentation
- stores requests (storage withdrawal forms)

No violations or deviations were identified other than those that had been previously identified by the piping contractor.

9. HVAC Installations

Two Unit I safety related HVAC duct runs were examined for conformance to fabrication sketches and installation drawing M-1285, Revision AA. The ducts were checked for correct identification, location, damage, configuration, adequate joint sealant, joint tightness, dimensional conformance, and general weld quality. The inspection included one run consisting of ducts 3727, 3728, 3729, and 3730 and another run consisting of ducts 3758, 3760, 3761, and 3762. Duct number 3762 was found to be damaged (two 1/16 inch diameter holes) and had some welding deficiencies; however, these deficiencies had been identified by BCAP inspectors. The BCAP findings were identified on Commonwealth Edison nonconformance report No. 6071. Based on the documentation of the deficiencies on nonconformance report No. 6071, this issue is considered closed.

No violations or deviations were identified.

10. Hydrostatic Tests

The hydrostatic test program of the piping contractor was reviewed, including procedure PGCP-39, "Pressure Testing of ASME and Safety Related Piping." The inspector also reviewed three hydrostatic test report packages listed below:

System	Applicable Drawings	Date of Test
Safety Injection	M-2061 Sheet 1	03/19/85
Chilled Water	M-118 Sheet 1 M-82 Sheet 15 M-82 Sheet 14	03/28/85
Component Cooling Water	M-66 Sheet 2 M-66 Sheet 4	07/13/84

The hydrostatic test program and test report packages met the requirements of the ASME Boiler and Pressure Vessel Code, Section III, however, two concerns were identified.

a. Drawings or weld maps identifying the location of all the welds were not being provided to the quality control inspectors. The ASME Code, Section III, requires that following the application of the hydrostatic test pressure for a minimum of ten minutes, all joints shall be examined for leakage. The inspector posed the following questions to the licensee:

"If weld maps or drawings identifying the welds are not being provided to the quality control inspectors, who are supposed to inspect all the welds for leakage, how are they sure they have inspected all the welds? Since documentation identifying the welds is not being provided, is it reasonable to assume that all the in-service inspection stainless welds, which can be difficult to detect due to surface finish, have been inspected by the quality control inspectors?"

The licensee stated that the hydrostatic testing performed included a detailed hand over hand check of each foot of pipe, and this hand over hand check assures that all the welds are inspected, including the in-service inspection stainless welds. The inspector met with five hydrostatic test quality control inspectors who stated that they preferred to have weld maps which identified the location of all the welds. However, they also stated that during the hydrostatic testing they were performing detailed hand over hand checks and believed that all the welds had been inspected. Furthermore, the documentation test packages did not specifically state that all the welds were inspected, although Procedure PGCP-39 required all the welds to be examined. The adequacy of the past hydrostatic tests, completed without weld maps, will be further evaluated by the NRC and is considered an unresolved issue (456/85023-006; 457/85024-006).

b. The piping contractor had not established measures to assure that piping lines would be hydrostatically retested after removal of items within the line. Numerous items are being removed due to documentation deficiencies, such as material which is nonconforming due to lack of traceability. At the end of the inspection period the licensee and piping contractor were establishing measures to assure that lines, which have had or will have items removed, are subsequently retested. Pending adequate implementation and NRC review, this issue will remain open (456/85023-007; 457/85024-007).

No violations or deviations were identified.

11. Corrective Action Programs

The corrective action program for Avoid Verbal Orders (AVO), as defined in the disposition to L. K. Comstock (LKC) Nonconformance Report (NCR) number 1996, was evaluated for effective implementation. This NCR identified the use of AVOs to remove or reinstall electrical hangers by LKC craft personnel without issuing a Hanger Installation Report. Therefore, required inspections by LKC quality control personnel might not have been performed. NCR 1996 was issued March 30, 1984 and concurrence by CECo of the disposition occurred January 4, 1985. During this review, the corrective action was in the early stages of implementation. The inspectors determined that the AVOs previously issued were sequentially numbered and logged by accounting personnel. The AVOs reviewed clearly identified the work to be performed by the LKC craft. One problem was noted by the inspectors concerning "voided" AVOs. During discussions with the LKC personnel implementing the AVO corrective action, it was revealed that if an AVO was noted as "voided" in the log, the AVO was not processed per the disposition of NCR 1996. The inspectors selected two "voided" AVOs, No. 9 and No. 10, to determine if the work described on these AVOs was completed by LKC craft. Inspections of the items identified on these AVOs revealed that the work described had been performed. The inspectors discussed, with licensee personnel, the need for evaluating "voided" AVOs for possible impact on installed equipment rather than assuming the work was never performed. The licensee committed to evaluate "voided" AVOs under the corrective action program described in CECo NCR 1996. This corrective action will be further evaluated as implementation progresses.

The LKC Drawing Review Program (DRP) was reviewed to determine if there were any obvious programmatic problems that would affect the program's implementation. The purpose of this program, as stated in the program document is "To demonstrate that drawing revisions, made prior to initiating the current Engineering Drawing Review (May 1, 1984) and Rework Procedure (April 1, 1984), and the cessation of writing AVOs, have been properly implemented/corrected in the field and that QC inspections are current". Based on discussions with the licensee, the DRP was written due to a NRC open item (456/84-42-10; 457/84-38-10). This open item identified that there did not appear to be an adequate system established to assure reinstallation. The licensee stated that the DRP will determine if in fact there was an adequate system for controlling rework which was generated by revisions to electrical drawings. If the DRP indicates the rework system was ineffective, the licensee stated a corrective action document will be issued (i.e. NCR). No programmatic problems were identified.

The inspectors reviewed the corrective action program pertaining to the inspection/walkdown by LKC of installed safety related cable pan hangers. This corrective action program is documented as a supplement to CECo NCRs 708 and 709. This supplement, Sargent and Lundy's project instructions PI-BB-77, Revision 0, "Cable Tray Separation Walkdown Procedure", and PI-BB-85, Revision 0, "Instructions to Perform Survey of Safety Related Cable Tray Supports for Shop Weld Presence and for Hanger Configuration" were reviewed and no apparent programmatic problems were identified. The inspectors verified implementations of this corrective action program by inspecting the following cable pan hangers:

20E-1-3043-H002
20E-1-3221-H0013
20E-1-3221-H0014
20E-1-3221-H0015
20E-1-3251-H063

The drawings and inspection records associated with these hangers were reviewed and compared with the results of the inspections conducted by the NRC inspectors. As a result of this comparison, a dimension for hanger 20E-1-3043-H002 and a dimension for hanger 20E-1-3251-H063 were noted as being different than the dimensions recorded by LKC Quality control. This was brought to the attention of the licensee who took immediate action. The dimensional discrepancy did not have a safety significance.

No violations or deviations were identified.

12. Electrical Installations

Three conduits recently inspected and accepted by L. K. Comstock quality control were inspected to verify conformance with established requirements. The conduits inspected and the applicable drawings were:

Conduit	Drawings
C0A8654	20E-0-3386 CT1 20E-0-3386 20E-0-3386 C03 20E-0-3386A
C1A1752	20E-1-3317 20E-1-3317A 20E-1-3317 D02 20E-1-3317 CT1 20E-1-3317 C04 20E-1-3317 C010
C1R54J0	20E-1-3591 Sht. 2 20E-1-3554A 20E-1-3554 CT2 20E-1-3554 C06

The conduits were inspected for correct size, number of supports, support location and the distance between supports. No problems were identified.

The inspector selected four electrical panels and one motor control center (MCC) to determine if the installations were in accordance with design requirements. This was accomplished by reviewing installation records and inspecting the installed equipment. The equipment inspected and the documents reviewed were:

Equipment	Records	S&L Design Documents
1PS044J (Containment 1PS043J Hydrogen Monitor Panels)	Welding Installation Record; CEA In-Process Inspection Checklist; Installation Report; Inspection Checklist; Weld Inspection Checklist; Component Fabrication Installation Record	20E-0-3334 Detail: D01 ECN 24856
1PS047J (Containment Hydrogen Monitor)	Welding Installation Record; CEA In-Process Inspection Checklist; Weld Inspection Checklist; Fabrication Installation Record	20E-0334 Detail: ECN 24515
1VE01J (HVAC Control Panel)	Equipment Installation Record; Concrete Expansion Anchor Inspection Record	PL-3 Detail:10-6 FCR L-8486
1AP21E (MCC)	Inspection Reccrds for the Re-torquing of Mounting Bolts	Disposition to CECo NCR #596

The review of the above records revealed no deficiencies. The inspection of this equipment to verify conformance to the S&L drawings revealed that panel 1VE01J was not installed in accordance with FCR L-8486. However, further investigation revealed that this panel was selected for a BCAP inspection and the discrepancies associated with the installation were already identified as a BCAP observation. No other problems were noted.

No violations or deviations were identified.

13. Open Items

Open items are matters which have been discussed with the licensee, which will be reviewed by the inspector and which involve some action on the part of the NRC or licensee or both. Open items disclosed during the inspection are discussed in Paragraphs 5 and 10.

14. Unresolved Items

Unresolved items are matters about which more information is required in order to ascertain whether they are acceptable items, items of noncompliance, or deviations. Unresolved items disclosed during the inspection are discussed in Paragraphs 3 and 10. Unresolved items identified in this report will be subject to detailed NRC review.

15. Exit Interview

The inspector met with licensee and contractor representatives denoted in Paragraph 1 during and at the conclusion of the inspection on June 21, 1985. The inspector summarized the scope and results of the inspection and discussed the likely content of this inspection report. The licensee acknowledged the information and did not indicate that any of the information disclosed during the inspection could be considered proprietary in nature.