U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Reports No. 50-456/85015(DRP); 50-457/85016(DRP)

Docket Nos. 50-456; 50-457 Licenses Nos. 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: March 25 through May 3, 1985

Inspectors: R. D. Schulz

W. J. Kropp

R. N. Gardner

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

5/16/85
Date

Inspection Summary

Inspection on March 25 through May 3, 1985 (Report No. 50-456/85015(DRP); 50-457/85016(DRP))
Areas Inspected: Routine, unannounced safety inspection of activities with regard to licensee action on previous inspection findings and 10 CFR 50.55(e) reports, followup on allegations, plant tours, nonconformance reports/corrective action, safety-related piping, containment coatings, instrumentation, electrical equipment installations, and the Quality Control Inspector Reinspection Program. The inspection consisted of 352 inspector-hours onsite by three NRC inspectors including 30 inspector-hours onsite during off-shifts.
Results: Of the nine areas inspected, no items of noncompliance or deviations were identified in five areas, one item of noncompliance was identified in each of the remaining four areas: failure to adequately control structural beam modifications (paragraph 4); failure to take adequate corrective action for pipe support nonconforming conditions (paragraph 5); inadequate review of containment coating process (paragraph 7); and inadequate inspection of junction box installation (paragraph 9).

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
C. Gray, Project Construction Supervisor
*D. Skoza, Engineering Supervisor
M. Gorski, Engineer
M. Curinka, Engineer
*D. Boone, Project Construction Field Engineer

Phillips Getschow Company (PGCo)

*T. O'Connor, Site Manager
*J. Carlson, Quality Control Supervisor
*J. Stewart, Project Engineer
G. Galloway, Assistant Project Engineer
R. Hamilton, Welding Supervisor

G. K. Newberg Company

*D. Craven, Project Manager
*R. Donica, Quality Assurance Manager

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

*R. Seltman, Quality Assurance Manager
I. Dewald, Quality Control Manager
L. Seese, Assistant Quality Control Site Manager
D. Holley, Quality Control Inspector

Nuclear Installation Services Company (NISCO)

D. Niebaum, Regional Vice President

Pittsburgh Testing Laboratory

F. Forest, Site Manager

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

*Denotes those attending the exit meeting on May 3, 1985.

2. Licensee Action on Previous Inspection Findings and 10 CFR 50.55(e) Reports

a. Noncompliance

(Closed) 456/84009-05; 457/84009-05: Incorrect material installed for reactor coolant whip restraint plate 1WR-RC1-6. The plate was replaced per Field Change Order No. 1RC-7592 with the correct material. In addition, an audit was performed by the piping contractor and six other material deficiencies were noted and properly dispositioned.

b. Unresolved Items

(Closed) 456/83009-05; 457/83009-05: In 1983 the inspector identified a concern with the qualification and certification of the licensee's auditors. Based on audits reviewed by both the resident inspectors and Construction Appraisal Team personnel in 1984, it was determined that the training and knowledge level of the auditors has significantly increased. Present audits are adequate in both scope and depth. The manager of Quality Assurance approves all auditors for specific qualification areas and early in 1984 an experienced individual was added to the staff with sole responsibility for audit coordination. A qualification auditor matrix is maintained with documented evidence of qualifications.

(Closed) 456/83009-11; 457/83009-11: Welding discrepancies were identified on HVAC hanger No. 2210, hanger No. 2221, duct to flange connection (sheet 4033), and an actuator motor hanger bracket. All of the identified discrepancies were satisfactorily resolved through HVAC correction notices. The applicable correction notices were identified as Nos. 4463, 2826, 2844, 4461, and 4435.

(Closed) 456/84009-03; 457/84009-03: Whip restraint inspections to determine that washers were installed for high strength bolting were not required to be done. A retro-fit program has been implemented to assure that the washers are installed per specification requirements. In addition, a licensee hold point was placed on all ASTM A-490 bolted connections to allow site quality assurance to witness bolt tightening.

(Open) 456/84009-09; 457/84009-09: Lack of a documented training program for craft personnel. The licensee presented this item to the NRC for closure based on documented records of craft training. Although craft training records were available, the licensee had not established a formal program identifying the specific training

required for each discipline, such as cable pans, conduit, or concrete anchors. Each of these disciplines is controlled by written procedures. Without an established formal program the inspector was unable to determine if craft personnel were properly trained in their applicable work assignments. The licensee acknowledged the inspector's concerns. This item will remain open pending the resolution of the inspector's concerns.

c. 10 CFR 50.55(e) Reports

(Open) 456/83015; 457/83015: Pacific Scientific snubbers supplied with capstan springs may be defective and fail during a seismic event. Subsequent testing and metallurgical evaluation revealed that the snubbers met design requirements and there was no reportable deficiency. However, a PS letter dated February 10, 1984, recommended that "due to the various potentially harsh environments on usage some snubbers might experience, these snubbers be the first to be inspected during normally scheduled plant inservice or maintenance inspections". This item was submitted to the NRC for closure; however, until an inspection plan is formulated that would identify any defective capstan springs, this item will remain open.

No violations or deviations were identified.

3. Followup on Allegations

a. (Closed) Allegation (RIII-85-A-0071). Undocumented removal of welds from structural steel after removal of block walls. The foreman and craft workers were interviewed and the inspector determined that welds had been removed without the traveler package authorizing the weld removal. However, subsequent examination of the completed traveler packages disclosed that all removal areas were inspected for gouges or defects and the final weld areas were also subject to quality control inspections. In addition, this allegation was discussed with the structural contractor and licensee, and on April 23, 1985, a training session was held with structural craft personnel emphasizing that welds could not be removed without a traveler authorizing weld removal. This allegation is considered to be closed.

b. (Closed) Allegation (RIII-85-A-0058). L. K. Comstock (LKC) inspectors recently certified as Level II in the areas of configuration and welding were rushed through the training program. The training records for three recently certified LKC inspectors were reviewed. The three inspectors had the required experience and training for being certified as Level IIs in configuration and welding. The training for each inspector consisted of 40 hours of mock inspections in each certification area. Each inspector passed a general test consisting of 40 questions and a practical exam in each area of certification. A sample of the three inspectors' previous field

inspections were randomly selected and evaluated by the NRC inspector. The samples included 13 weld inspections and 8 configuration inspections. No problems were noted. This allegation is considered to be closed.

No violations or deviations were identified.

4. Plant Tours

A considerable amount of time was spent in plant tours during this inspection period, with emphasis on on-going work activities. Observation of work included safety-related pipe welding, reactor coolant pipe welding, HVAC welding, structural welding, anchor bolt installations, cable tray support installations, removal and installation of instrument piping, pipe support welding and installations, and completed electrical equipment installations. Particular note was taken of material identification, nonconforming material identifications, and housekeeping. Craft personnel were interviewed in the work areas.

The inspectors identified three safety-related beams in the auxiliary building which had openings flame cut into them to permit the routing of 4" diameter nonsafety-related piping through the web of the beam. Investigation of the installation documentation and structural drawings identified the following noncompliance.

Five inch diameter openings cut in the web areas of beams 8AB794 and 8AB799N were not permitted by any instruction or procedure, or Drawing S-1314, and had not been identified by the licensee or contractors through a field design change request or quality control inspection. A 6" diameter opening in the web of beam 6AB145 was specified on Drawing S-1293; however, a 5 1/2" x 13" oval opening was cut in the web and this nonconforming condition was not identified by the licensee.

Failure to adequately control the modifications of the beams by the piping crews is a violation of 10 CFR 50, Appendix B, Criterion II. The licensee had not established an inspection program for structural beams that were modified during piping installations, and had not established an adequate craft training program with regard to nonsafety-related piping installation activities resulting in field design modifications to safety-related structural steel (456/85015-01; 457/85016-01).

During an inspection of battery room wall No. 211, Unit 2, several concrete expansion anchors were found to be nonconforming with regard to concrete edge distance. The installation documentation was reviewed and it was determined that Pittsburgh Testing Laboratory inspectors had identified the following discrepancies:

- Eight anchors on assembly 8AT95 were rejected due to concrete edge distance violations of standard specification BR/CEA, Revision 21.

- A concrete expansion anchor had been rejected on assembly 8AWC195 for a 70 foot-pound torque reading that was required to be 145 foot-pounds.

- A concrete expansion anchor on assembly 8AT94 had been rejected due to an embedment plate edge distance violation of standard specification BR/CEA, Revision 21.

The anchor that failed to meet torque requirements was inaccessible as a block wall was installed over the 8AWC195 assembly. The inspector discussed these discrepancies with the Gust K. Newberg Quality Assurance Manager, including the error of installing over the 8AWS195 assembly without correcting the insufficiently torqued anchor. The inspector stated that additional training for the craftsmen, who installed the anchors and the block wall, would appear to be appropriate. The Quality Assurance Manager for Gust K. Newberg acknowledged the inspector's concerns and was investigating the adequacy of the craft training. Although these discrepancies have all been identified by Pittsburgh Testing Laboratory, corrective action to prevent repetitious findings will be the subject of future concrete expansion anchor inspections by the inspectors.

The installed bolts for the steam generator inner frame support columns and the inner frame support corner connections were examined. The inspector found loose bolts and bolts with inadequate thread engagement on the support columns, however, documentation reviews revealed that these deficiencies had been identified by Nuclear Installation Services Company inspectors. The deficiencies were identified on Nonconformance Report No. 3009-96 and were under an established corrective action program. The corner connections also had loose bolts; however, the loose bolts also had been identified and were controlled by process control checklist 3009-CCE-126. The checklists required that the tightening of the bolts be accomplished by the turn-of-the-nut method and mandated quality control verification of proper tightening. This work had not been completed or signed off by quality control. The loose bolt issue is considered closed based on adequate contractor controls.

While inspecting the shims on the steam generator inner frame support corner connections, identified on drawing S-1102, the inspector noticed that the nuts on the threaded rod that held the shims in place were not tight. Subsequent investigation of the documentation, including process control checklist 3009-CCE-126, disclosed that the required tightness or torque value for the 1/2" diameter nuts (#1155) had not been established. This will remain an open item pending licensee review of the installation (456/85015-02; 457/84016-02).

During a tour of the unit one containment the inspectors examined two chemical and volume control piping supports, 1CV05005R and 1CV07020V. The supports consisted of structural steel welded to embedment plates. The embedment plates were fastened to the concrete wall by concrete

expansion anchors. Each support had eight expansion anchors; however, one of the anchors for support 1CV07020V did not have identification markings. The markings, placed on the anchor by the manufacturer, identifies the length of the bo't. Since the marking was missing the length of the anchor remained unknown. The inspectors discussed this issue with the piping contractor's supervisory personnel and a decision was made by the supervisors to perform an ultrasonic test of the anchor. The anchor length was checked by Pittsburgh Testing Laboratory utilizing a Kraut Krammer USK-7 pulse-echo type flaw detector and a .25 inch diameter 10MHZ transducer. The report, written by a Pittsburgh Testing Laboratory inspector, stated that the anchor was only 8 inches long. The anchor was required to be 10 inches long. The piping contractor believed the anchor was 10 inches long, as stipulated on the stores request, and requested that the ultrasonic test be re-performed. The ultrasonic test was again performed by the same Pittsburgh Testing Laboratory inspector. This time the ultrasonic inspector was accompanied by the NRC inspector and a piping supervisor. The re-test validated that the anchor was actually 10 inches long as required by the piping support detail. The NRC inspector witnessed the test and discussed with the ultrasonic test inspector the importance of assuring that the unit was properly calibrated prior to the test and the importance of being attentive to the chart display that measures the length of the anchor. The NRC inspector's comments were acknowledged and this issue is considered closed.

Several whip restraints were being removed in the Unit 1 containment as a result of the leak before break piping analysis reviewed and accepted by NRR. The craftsmen were working under a controlled process documentation system and all areas of removal were being inspected. Feedwater whip restraint 1WR-FWR-23 was a typical example of a controlled removal. The restraint was for a sixteen inch feedwater line, 1FW03DC.

The inspectors examined the reactor coolant loop piping and identified that the 31" cold leg loop 1, 40 degree elbow on line 1RC02AA-31 had a material identification plate missing. It appeared that the plate had been removed by grinding the tack welds leaving gouges in the pipe. This was brought to the attention of the piping contractor. The gouges were subsequently measured and found to be 1/32" deep x 1/2" long x 1/8" wide. Nonconformance Report No. 4456 was written by the piping contractor, and the area will be penetrant tested and repaired as needed. This issue is considered closed. The inspectors also identified areas of indentation on the 40 degree elbow which may have been casting inclusions that were ground out and nondestructively examined. The licensee provided documentation that the indentation areas had been identified by the manufacturer, repaired, and accepted through nondestructive examination. In addition, wall thickness measurements were performed and the thickness of the castings met the requirements of the ASME Code. This issue is considered closed.

The inspectors witnessed numerous modifications to instrument piping as a result of the lines being originally installed without sufficient slope. The removals and re-installations were being performed under a controlled authorization system according to approved retro-fit procedures.

Inside the missile barrier wall at elevation 413 feet the inspectors noticed a 10" diameter safety injection pipe, 1SI09BC-10, in direct contact with mechanical sleeve 1RB-332. The pipe did not appear to have adequate clearance, considering thermal movements, and the finding was brought to the attention of the piping contractor. After an inspection was performed by the piping contractor, a clearance notification form, No. CNC-282, was issued. This form is issued to Sargent and Lundy for clearance resolution. This pipe is a typical example of the numerous clearance problems that will need to be resolved by the licensee prior to fuel load. The licensee was issued a violation in NRC Inspection Report No. 50-456/84009 and 50-457/84009 for failing to establish adequate clearance criteria and decided to resolve any deficiencies during hot line walkdown inspections prior to fuel load. The Construction Appraisal Team Inspection Report 50-456/84044 and 50-457/84040 stated that a major area of concern was the dependance on final walkdown inspections late in the construction program to identify and resolve problems.

During a tour of the lower cable spreading room the inspectors noticed that safety-related cable 1W0210C2E was in direct contact with nonsafety-related cables 1AN092C2B, 1AN082C2B, and 1AN099C2B. The inspectors followed the cable to panel 1PA32J in the control room area and found a hold tag on the cabinet. The hold tag was traceable to a cable separation conflict report which is the controlling document for resolving the separation violation. Cable 1W0210C2E was identified on the conflict report. Since this item had been identified by the electrical contractor and is being addressed for resolution, this issue is considered closed.

Junction box, 1JB335R was found removed from a wall and was being supported by a cable. A review of the installation records revealed that this junction box was originally installed and inspected in 1982. A review of the present rework records could not substantiate that this junction box was removed from its mounting in a controlled manner. The electrical contractor, L. K. Comstock, issued an NCR to identify the removal of this junction box without using the rework procedure. The inspector did not identify any other unauthorized removal of electrical equipment. The unauthorized removal of junction box 1JB335R is at this time considered an isolated case. This area will be closely monitored in future inspections.

In the auxiliary building at elevation 440 feet, the inspectors noticed that a portion of the supports for the trolley beam had been cut away. The structural drawings for this area were reviewed and the referenced field change requests were examined. Field Change Request No. L-16070 had been approved by Sargent and Lundy and allowed the supports to be modified or coped to permit adequate pipe clearance. The actual dimensions of the supports for the trolley beam were then physically examined for compliance with the Sargent and Lundy approved modification. The supports were found to be coped in accordance with the approved detail. The inspectors have no further questions with regard to this item.

5. Nonconformance Reports/Corrective Action

The inspectors reviewed nonconformances written by the licensee, electrical contractor, and piping contractor to verify that measures have been established to identify and correct conditions adverse to quality. Corrective action taken to preclude repetition was also examined.

The following piping nonconformances were reviewed:

NCR No.	Subject
2719	Removal of an untraceable feedwater pipe.
2201	Ferrite readings of stainless welds.
2636	Piping linear indications.
2621	Minimum wall violation.
2612	Welds in radius of bends.
2608	Minimum wall violation.
2597	Remove and replace small bore piping.
2598	Minimum wall violation.
2592	Calibration of torque wrenches.
2584	Repair of pipe.
2535	Calibration of inside micrometer.
2514	Piping traceability.
2492	Main steam whip restraint.

The nonconforming conditions, with the exception of Nonconformance Report Nos. 2201 and 2636, were properly identified and corrected.

Nonconformance Report No. 2201, written on October 9, 1984, identified field weld No. 2A, on line 1CV18A-3" as having a surface delta ferrite measurement of 3.5 to 5.0 percent. The ASME Boiler and Pressure Vessel Code, Section III, Subsection NB-2433 states in part that the weld filler metal shall be 5% minimum. The FSAR states in part in Section 5.2, "Integrity Of Reactor Coolant Pressure Boundary", that weld filler metal is procured to be capable of providing not less than 5% delta ferrite in the weld deposit. Sargent and Lundy accepted the 3.5 to 5.0 percent measurement based on the written disposition that most literature sources indicate that problems (hot cracking) do not develop if ferrite content is greater than 3%. The Sargent and Lundy disposition did not reference

Regulatory Guide 1.31, Revision 1, which states that a delta ferrite level above 3 percent at the surface is sufficient to prevent hot cracking or fissuring. Furthermore it did not reference that ferrite measurements for the welders' qualification coupons were found to be acceptable. The licensee agreed that the Sargent and Lundy disposition of nonconformance report #2201 should have been more specific; including referencing the Regulatory Guide 1.31 statements and welder qualification coupon test results. This issue is considered closed, however, the inspectors requested that Sargent and Lundy be more specific in their dispositions and justify acceptance with adequate engineering analysis.

Nonconformance Report No. 2636 documented a minimum wall violation for an installed 2" diameter pipe. The heat number of the pipe was KD 6751. This is the same heat number that was referenced in 10 CFR 50.55(e) Report No. 84-10 concerning potential minimum wall violations. Further investigation by the inspectors disclosed that Nonconformance Reports Nos. 1611, 1294, 2558, and 2633 also documented minimum wall violations for pipe heat No. KD 6751 installed in the field. These nonconformance reports were closed based on the licensee's plan to take sufficient samples of all small bore pipe heat numbers identified in NRC Inspection Report 456/84017 and 457/84017 and identified by Open Item No. 84017-03. The sampling plan is described in Phillips Getschow Nonconformance Report No. 2001 and Commonwealth Edison Nonconformance Report No. 633R1. However, the sampling plan did not specify that the items previously identified on Phillips Getschow nonconformance reports, such as No. 2636, would be included in the sample and analyzed by Sargent and Lundy. The required wall thickness for the installed 2" pipe on Nonconformance Report No. 2636 was a minimum of .191 inch wall. The actual recorded measurement was .156 inch wall. This wall deficiency should be analyzed by Sargent and Lundy, taking into consideration design allowables. The specific disposition of wall thickness violations identified in Phillips Getschow nonconformance reports is considered an open item pending licensee and NRC review (456/85015-03; 457/85016-03).

The inspector reviewed five nonconformance reports written as a result of the Material Traceability Verification Program. The details of these reports are summarized below:

Report No.	Description of Nonconformance
3226	Stores request identified pipe heat number as 6" S/40; however, 6" S/80 pipe was installed. Pipe is dispositioned for replacement due to uncertainty of heat number installation. ASME Subsection NC, Feedwater Line. The inspectors witnessed the ultrasonic thickness measurement which recorded that 6" S/80 pipe was installed.
2848	Incorrect heat number placed on 3" elbow by craftsmen with nuclear grade marker. ASME Subsection NC, Chemical and Volume Control Line.

2531	Incorrect heat numbers vibroetched on two 3" fittings by craftsmen. Positive traceability is indeterminate. ASME Subsection NC, Chemical and Volume Control Line.
2009	Heat number identified on installed 3/4" S/40 pipe is not the same heat number identified on the stores request. ASME Subsection NC, Safety Injection Line.
3927	6" x 3/4" Sockolet is not traceable as ASME material. ASME Subsection ND, Component Cooling Line.

The Material Traceability Verification Program was instituted as a result of an NRC finding identified in Inspection Report Number 83009, which stated that a documented inspection program to verify correct material installation had not been implemented for 2" and under safety-related piping prior to July 1983, and for over 2" safety-related piping prior to November 1982. As a result of this finding the licensee decided to inspect all the piping installed prior to the above applicable dates (approximately 23,220 items) in order to determine the acceptability of piping material installations.

The Material Traceability Verification Program has appeared to be satisfactory in the identification of deficiencies. However, the inspector has the following concerns with regard to verification of traceability based on the corrective action program's findings:

a. It was found that approximately 3150 piping components have no traceability markings. Therefore, it remains to be determined how the quality control inspectors substantiated that the stores requests matched the markings on the piping components. Furthermore, approximately 566 piping components had traceability markings but did not have stores requests. Therefore, a yellow paint stick traceability marking placed on the pipe by a craftsman could not be verified against a stores request.

b. Records indicated that in numerous cases, greater quantities of material were requisitioned than installed. Although the material was to be returned to storage areas, numerous required overage material return reports do not exist. Therefore, according to the records, whether this overage material was scrapped, returned or installed in another location not in accordance with drawing requirements is unknown.

c. When pipe was cut the transfer of traceability markings was witnessed by quality control inspectors on a limited basis. Only a small sample of marking transfers were documented. Furthermore, the piping contractor has identified three examples and the NRC has identified one example where the wrong heat number was placed on a piping component by a craftsman. This is a concern for those items which only have craft markings instead of manufacturer markings.

The disposition of the items identified on nonconformance reports, as a result of the Material Traceability Verification Program, should be completed by the licensee by the end of May 1985 and will be subject to NRC review.

The following electrical nonconformance reports, written by the contractor, were reviewed for proper identification, closure, and corrective action to prevent repetition as applicable:

Reports No.

4033	4016
4013	4011
3908	3991
3987	3988
1616	3590
3591	3541
3419	3410
3195	3005
3002	2957
2944	2940
2941	2889

The nonconformances concerned welding details, cable tray supports, junction box installations, cable pan separation, calibration of installation tools and measuring devices, conduit separation, and inadequate quality control inspections.

The inspectors identified two areas of concern:

a. Numerous nonconforming items were accepted based on the disposition, "use-as-is". However, no justification for the acceptance was provided on the nonconformance report even though there was a block on the report entitled, "Explain Justification". The licensee stated that Sargent and Lundy justification documentation does exist, and is located either at the Braidwood Site or at the Sargent and Lundy Corporate offices. Pending NRC review of the Sargent and Lundy documents, this issue is considered an open item (456/85015-04; 457/85016-04).

b. Nonconformance report number 3419 identified numerous deficiencies in the electrical contractor's calibration program. Calibrated tools or measuring devices included in the scope of the nonconformance were: torque wrenches, thermometers, dynamometers, welding machines, rod ovens, volt amp meters, micrometers, crimpers, and wire strippers. The report identified calibration test results found rejectable, missing records, lost tools, and failure to have past inspections/installations evaluated when these activities were based on indeterminate or incorrect calibrated tools or measuring devices. The corrective action required a statusing of all calibrated tools or measuring devices on the Braidwood project with the results of the

findings analyzed for past hardware deficiencies. In the past, various calibrated tools or measuring devices used for electrical inspections or installations were not always recorded for specific components. An example is the electrical penetration installations discussed in NRC Inspection Report 50-456/83018 and 50-457/83017, where the electrical contractor failed to identify the torque wrenches employed. The evaluation of past inspections should take into account inspection reports that have not documented the calibrated tool or measuring devices used in the installation or inspection operation. The final disposition of this nonconformance report will be reviewed by the NRC and is considered an open item (456/84015-05; 457/85016-05).

Several of Commonwealth Edison's closed Nonconformance Reports (NCRs) were selected for review to verify proper identification, documentation, segregation and disposition. The licensee's procedure QP 15-1, Revision April 10, 1985, "Reporting Quality Nonconformances During Construction and Test" was the basis for determining adequate processing of these NCRs. The NCRs selected for review were NCRs 191, 586, 589, 600, 608, 628, 661, and 667. As a result of this review it was determined that all the NCRs sampled, except for NCR 600, were properly processed in accordance with QP 15-1.

The licensee's site QA organization initiated NCR 600 on October 28, 1983. This NCR identified twenty (20) ASME, Section III, Class 1 supports in which the Westinghouse design drawings had classified some of the hardware as linear "secondary" members when in the fact the application required them to be identified as linear "primary" members. Since some of the hardware was improperly classified as linear secondary members, the NCR stated, "As a result: No traceability to a CMTR was provided during fabrication or installation, and incorrect weld identification caused incorrect N.D.E. inspection". The final disposition of NCR 600 furnished by Sargent & Lundy and the licensee was as follows:

- drawings for seven supports were revised to correctly identify what members were linear-primary.
- drawings for nine supports were revised to show there were no linear and primary members.
- two supports were deleted.
- one support was redesigned to eliminate the linear and primary members.
- one support could not be found.

The licensee's site QA organization closed NCR 600 on September 14, 1984, based on the S&L drawings being revised. To verify the effectiveness of the method that site QA used to close the NCR, the inspector reviewed the installation of several supports with the following results:

- Two supports of the seven which had the drawing revised to correctly identify the linear members were inspected. One of the supports selected, 1CV06031V, had tube steel (3" x 3" x 1/4") installed as a linear primary member. This tube steel was procured on Purchase Order No. 266483 as a commercial grade item from Hagerty Steel. The purchase order did not require the vendor to have an ASME, Section III, NA 3700, QA program as required by subsection NF 2600 of the ASME Code. Also 10 CFR 21 reporting requirements were not imposed on the vendor. In addition, field welds 3 and 4 were not examined by the magnetic particle or liquid penetrant method as required by ASME, Section III, NF 5212. These welds were only visually examined for possible defects. The other support selected was found to be installed satisfactorily.

- One support, 1RH02020R, which was identified in the final disposition as having the drawing revised to show there were no linear primary members, was inspected and found to have a linear primary member. This support was installed on November 1984. The linear member was a piece of tube steel (4" x 4" x 1/2") procured in the same manner as the previous tube steel for support 1CV06031V identified above.

- Since two of the Class I supports associated with NCR 600 had material and NDE deficiencies the inspector selected three other Class I supports that were not associated with NCR 600. Two of the supports were found to be satisfactorily installed. However, support 1SI03046S was found to have tube steel (Purchase Order No. 256395) and plate (Purchase Order No. 266483) procured in the same unsatisfactory manner as the previous material identified above. In addition, field welds 5 and 6 were not examined by the magnetic particle or liquid penetrant method as required by the ASME Code. These welds were visually inspected for possible defects.

Based on the above results, the site QA corrective action for the supports detailed on NCR 600 was not adequate and additionally was not effective in identifying a generic problem with the installation of ASME Class I supports. This failure to identify and correct nonconforming conditions is considered a violation of 10 CFR 50, Appendix B, Criterion XVI (456/85015-06).

6. Safety Related Piping

The inspector observed in-process alignment and welding on the following piping lines:

- 1NT12AD - 3/8", Nitrogen Purge piping for containment penetrations

- 1FW03DC - 16", Feedwater piping

- 2CV17C - 3", Chemical and Volume Control piping

- ISI78BB - 1/2", Safety Injection piping

- 1BR04A - 3", Boron Thermal Regenerative piping
- 2CV16F - 2", Chemical and Volume Control piping
- 2AF16B - 3", Auxiliary Feedwater piping
- 2CV24AA - 2", Chemical and Volume Control piping
- 2CC37A - 2", Component Cooling piping
- 1CC50AA - 3", Component Cooling piping
- 2AF02AA - 6", Auxiliary Feedwater piping
- 1MS01AC - 32", Main Steam Piping
- 1RC40EB - 1/2", Reactor Coolant piping
- 1FW03DB - 16", Feedwater piping

Field weld data sheets and weld rod stores requisitions were checked to verify identification and inspection of criteria procedurally required for quality welding. The weld data sheets included documentation of fit-up inspections, root weld inspections, final weld inspections, and nondestructive examinations. Attributes checked in the field included: quality of the welds, identification of the weld and welder, and identification of the spool piece.

While examining field weld 6 on piping line 2CV17C - 3", Spool CV-22, the inspectors noticed that work had proceeded past the mandatory hold points on the temporary attachment control sheet for penetrant testing of the tacking blocks removal area. This was brought to the attention of the piping contractor and since the penetrant test was not performed a nonconformance report was issued. The nonconformance report, No. 4441, stated that a penetrant test would be performed on the final weld, including 1/2" on both sides of the weld. This corrective action resolves the craft error to the satisfaction of the NRC inspectors.

No violations or deviations were identified.

7. Containment Coatings

The coating repair work presently being performed on structural steel within the containment was evaluated for compliance to applicable standards and the painting contractor's (Midway) procedure QCP 3, Revision 3, dated October 27, 1982. Procedure QCP 3A describes the coating system to be utilized for repairing surfaces coated with Carbo Zinc 11 and Carbo Zinc 11/Phenoline 305 primer. When surface preparation of the repair cannot be accomplished by oper blasting or vacuum blasting, the procedure allows the surface to be prepared using a power grinder with a 3-M Clean N Strip Wheel to produce an anchor pattern of

approximately 1 MIL. The repair work observed in the containment consisted of preparing the surface in accordance with procedure QCP 3A and then applying a coating of Carbo Zinc 11. A topcoat of Phenoline 305 was not going to be applied on the repaired areas. The repair work presently being accomplished in the containment is in compliance with the requirements of procedure QCP-3A.

The inspector requested documents to substantiate that the system used for repairing the coatings, was qualified in accordance with ANSI N101.2 (1972) "Protective Coatings (Paints) for Light Water Nuclear Reactor Containment Facilities", Section 5. The licensee furnished test reports that substantiated that the repair system of preparing the surface with a power grinder utilizing a 3M Clean N Stop Wheel and then coating with Carbo Zinc 11 was qualified to the Design Basis Accident (DBA) in accordance with ANSI N101.2.

Further inspection revealed that repairs to coatings on the Unit 1/2 containment liner and equipment hatch were performed in 1978 and 1979 without a repair procedure qualified for DBA conditions. The inspection documents recorded the repair system as being the same as the repair system presently being used on containment structural steel with the exception of a topcoat of Phenoline 305 finish being applied. The inspector requested documents to substantiate the qualification of this system (power grinder, carbo zinc 11, topcoat of phenoline 305) to ANSI N101.2. The licensee could not produce any such documents nor could they provide documentation that these areas repaired were on the coating exception list. The amount of area affected has been tentatively identified as approximately 250 square feet. The failure to qualify a repair coating system to ANSI N101.2 or to identify unqualified coatings on an exception list is considered a violation of 10 CFR 50, Appendix B, Criterion III (456/85015-07; 457/85016-06). The licensee has provided corrective action for this noncompliance which is satisfactory and therefore a response to this item of noncompliance is not required. The corrective action consists of either repairing the coating areas that were repaired with the unqualified coating system or justifying the placement of these areas on the "Coatings Exception List". The action to preclude recurrence has been implemented by issuing a revised repair procedure that utilizes a coating system qualified to ANSI N101.2.

8. Instrumentation

Instrumentation was selected to verify that their installation was in accordance with requirements established in the appropriate design documents. The instrumentation selected were:

1-PT-544 - Pressure Transmitter
1-FT-619 - Flow Transmitter
1-FT-688 - Flow Transmitter
1-FT-AF017 - Flow Transmitter
1-FT-AF011 - Flow Transmitter

The installation attributes verified for compliance with specified requirements included:

- lines properly pitched.
- as-built dimensions
- clearances (rattle space)
- separation criteria

Four of the instruments selected had been processed through Phase I and Phase II of the piping contractor's Instrumentation Retrofit Verification Program. No problems were noted with these instruments in regards to the attributes listed above. However, during the walkdown of the instrument lines for 1FT-AF011 and 1FT-AF017, it was noted that the piping contractor had installed high point vents. These vents were installed to facilitate the removal of any air which could have been trapped as a result of the instrument lines being routed to avoid interferences. This routing resulted in the instrument lines sloping upward from the process line to the vents and then sloping downward from the vents to the transmitter. Discussions with operational personnel responsible for calibrating the transmitters revealed that they were not aware of some instrument lines having high point vents. This matter will be monitored to ensure that operations personnel identify which instruments have vents.

While inspecting the installation of instrument 1-PT-544, it was noted that a flex hose was installed in such a manner as to cause a trap to be formed. The piping contractor issued a Nonconformance Report to identify this deficiency. Five other instruments were inspected to verify proper installations of flex hoses. No problems were noted. The improper installation of the flex hose for instrument 1-PT-544 is considered an isolated case at this time.

No violations or deviations were identified.

9. Electrical Equipment Installation

Electrical equipment was selected to verify that the installation was in accordance with established requirements. The documents utilized as the basis for acceptance were S&L drawings 20E-1-3571, 20E-0-3393J, 20E-3391C, 20E-1-3371B and 20E-1-3627. The electrical equipment selected included:

- 1P05E - Inverter
- 1DC05E - DC Distribution Center
- 1JB215R - Junction Box
- 1JB271R - Junction Box
- 1JB214R - Junction Box

The following attributes were verified for compliance to specified requirements:

- location
- welding (size and location)
- cable bend radius
- separation
- mounting configuration
- as-built dimensions

One junction box, 1JB217R, was accepted by L. K. Comstock (LKC) for proper installation on August 1, 1984. There were no problems identified by the contractor's inspector except for missing "O" rings. However, the inspector determined that the following as-built dimensions were different than the dimensions on Sargent and Lundy drawing 20E-1-3571:

Attribute	As-Built	Drawing
Distance from bottom hex head cap screw to bottom of box	15 3/4"	18 1/2"
Distance from bottom hex head cap screw to middle cap screw	11 1/2"	9 3/4"
Distance from bottom CEA to bottom of box	15 1/2"	18 1/2"
Distance from bottom CEA to middle CEA	12"	9 3/4"

A review of the inspection records (LKC Form 38A) revealed that the original inspector did not verify the proper torquing of the hex head cap screws (3). An inspector, while performing a followup inspection to verify the installation of the missing "O-rings" identified by the original inspector, noticed that cap screws were installed and that these cap screws were never checked for torque. He subsequently verified the proper torque and amended the original inspector report accordingly. The failure to execute an inspection of an activity affecting quality to verify conformance with a drawing is considered a violation of 10 CFR 50, Appendix B, Criterion X (456/85015-08).

10. Q. C. Inspector Reinspection Program

The licensee instituted a Q. C. Inspector Reinspection Program to provide further objective evidence substantiating the quality of the hardware and the inspector qualification program. The inspector reviewed reinspection data compiled in February 1984 for the electrical contractor, L. K. Comstock, and the overview inspection company, Pittsburgh Testing Laboratory. The reinspection data disclosed that two of the nine electrical inspectors, whose work was re-examined, had approximately ten percent of their inspections categorized as rejectable. The NRC inspector reviewed their qualifications at the time of their inspections and identified that one of the inspectors did not appear to meet the experience requirements of ANSI N45.2.6 for Level I qualification and the other was lacking mock inspection training and specific examinations.

The reinspection data for five Pittsburgh Testing Laboratory inspectors was reviewed and one of the inspectors had 48 percent of his inspections categorized as rejectable. Another inspector had 39 percent of his inspections categorized as rejectable. The NRC inspector reviewed their qualifications and the inspectors did not appear to meet the experience requirements of ANSI N45.2.6 for Level I qualification. The Pittsburgh Testing Laboratory inspectors' work was again reinspected and this time the 39 percent reject rate was reduced to 15 percent and the 48 percent figure was reduced to 21 percent. The NRC inspector has concerns with the differing reject rates.

Subsequent discussions with the licensee disclosed that the licensee was in the process of formulating a detailed Q. C. Inspector Reinspection Program that would procedurally establish the scope and depth of the reinspection work. The licensee stated that the original reinspections were not completed under a procedurally established program and training for the inspectors performing the reinspections was inadequate, factors which contributed to the differing reject rates for the same installations. The inspector discussed with the licensee that although a new program is being formulated for implementation, the previous findings of the original Q. C. Inspector Reinspection Program must be resolved. In addition, it appears that the new program should take into consideration qualification and experience deficiencies that may have existed for past contractor inspectors. The licensee stated that the new program would resolve the inspector's concerns and substantiate the inspector qualification program. Additionally, the licensee stated that the previous quality control inspector reinspections that identified unacceptable hardware attributes would be resolved. Pending licensee implementation of the new program and resolution of previous rejected items, this is considered an open item (456/85015-09; 457/85016-07).

No violations or deviations were identified.

11. 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 4, 5, and 10.

12. Exit Interview

The inspector met with licensee and contractor representatives denoted in Paragraph 1 during and at the conclusion of the inspection on May 3, 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.