

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Reports No. 50-454/84-23; 50-455/84-16

Docket Nos. 50-454; 50-455

Licenses No. CPPR-170; CPPR-171

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

Facility Name: Byron Station, Units 1 and 2

Inspection At: Byron Site, Byron, Illinois

Inspection Conducted: April 9-13, 18-20 and 24-26, 1984.

Inspectors: R. Mendez *Rogelio Mendez* 6/11/84
Date

A. Gautam *Anil S. Gautam* 6/11/84
Date

Approved By: *C. C. Williams* 6/11/84
C. C. Williams, Chief
Plant Systems Section
Date

Inspection Summary

Inspection on April 9-13, 18-20 and 24-26, 1984 (Reports No. 50-454/84-23(DE); 50-455/84-16(DE))

Areas Inspected: Licensee action on bulletins, 50.55(e)'s, circulars and previous inspection findings, contractors QA implementing procedures, observation of electrical equipment installation, instrumentation installation and review of calibration records. The inspection involved a total of 110 inspector-hours by two NRC inspectors including 20 inspector-hours during off-shifts.

Results: In the areas inspected, one item of noncompliance was identified (failure to provide adequate QA records documentation, paragraph 6).

DETAILS

1. Persons Contacted

Commonwealth Edison Company (CECo)

G. Sorensen, Construction Superintendent
*K. J. Hansing, QA Superintendent
*R. B. Klingler, QC Supervisor
M. E. Lohmann, Assistant Construction Superintendent
*E. L. Martin, QA Supervisor
*J. O. Binder, Project Electrical Supervisor
*P. T. Myrda, QA Supervisor
*A. A. Jaras, DOAD Supervisor
*M. V. Dellabetta, QA Engineer
*J. F. Woldridge, QA Supervisor
*J. J. Blowinski, Assistant Project O.A.D. Supervisor
T. Mitoraj, QA Engineer

The inspector also contacted and interviewed other licensee and contractor personnel during this reporting period.

*Denotes those in attendance at the exit interview on April 13, 1984 and April 26, 1984.

2. Licensee Action on Previous Inspection Findings

(Closed) Unresolved Item (454/80-12-05): This item pertained to NRC concerns regarding significant amounts of rework being performed on safety related equipment. Based on subsequent reviews and present completion status of the plant this item is closed.

(Closed) Unresolved Item (454-81-08-03; 455/81-07-02): This item pertained to concerns regarding the installation of equipment prior to receipt of seismic and environmental reports. CECo and Sargent and Lundy documentation reviews were evaluated for the present status of these reports. Based on documentation reviewed by inspector on site it appears that seismic reports have been received at the S&L office to satisfy the extent of this concern. Environmental reports shall be followed up through reviews of licensees responses to bulletin 79-01. Based on the above review this item is closed.

(Closed) Open Item (454/83-16-02): This item pertained to discrepancies in the separation of instrument tubing between redundant trains. When this discrepancy was originally identified S&L Spec F-2906, amendment 6, 4/22/83, called for 18" between sensing lines. Specification F-2906 Amendment 9, 11-3-83 Section 302.2d now allows less than 18" for those instrument lines (piping), based on Westinghouse analysis letter CAW-6103 dated July 22, 1983. The inspector also reviewed sensing lines in the containment building and found no apparent deficiencies. Based on above review this item is closed.

(Open) Noncompliance (454/82-17-05; 455/82-12-05): This item pertained to separation between safety related cable trays and non safety related cable trays. S&L has completed their review of these violations and cable tray drawings have been marked to identify locations of conflict as well as indicate an analysis exists. Examples were reviewed in the field to verify identification on drawings and CECO cable tray walkdown reports were reviewed for justifications. A further NRC review is planned for verification of field conflicts being identified on drawings and justifications for their acceptance. Pending completion of this review this item remains open.

(Open) Noncompliance (454/82-17-06; 455/82-12-06): This item pertains to violations of cable separation requirements in IEEE 384. S&L has completed their analysis of these violations and has justified cable separation conflicts on a case by case basis. Pending an NRC review of examples of this analysis this item remains open.

(Closed) Noncompliance (454/82-19-01; 455/82-14-01): This item identified three instances where Class 1E cables were apparently not installed in accordance with their respective pull cards. This item is closed based on discussions to determine the correct interpretation of the three foot routing tolerance rule and verification of the installation of the cables in the auxiliary building.

(Closed) Open Item (454/82-19-05; 455/82-14-05): This item involved several instances where tray covers were not clearly designated on drawings. As a result separation conflicts identified in the field by the inspector were not designated on drawings. The licensee has completed a 100% walkdown of the electrical cable tray systems to determine separation conflicts as outlined in the Byron FSAR. Sargent and Lundy reviewed the cable tray walkdown reports and they appear to have taken the necessary actions to disposition the items identified in the reports. The disposition involved relocating the trays, justifying the effects of the existing separation or the addition of cable tray covers. In addition, all drawings which have been revised to incorporate corrective actions, have been issued for electrical installation to the electrical contractor.

(Closed) Unresolved Item (454/83-25-02): This item pertained to the energizing of motor operated valve (MOV) heaters in limit switch compartments. The Westinghouse instruction manual suggests that internal heaters be energized when MOV's are stored in place for extended periods of time. Information provided by the licensee indicates that not energizing the heaters in the limit switch compartments would have no adverse effects on the safe operation of motor operated valves.

(Closed) Unresolved Item (454/83-52-01): It was previously identified that separation between a Class 1E tray and an HVAC duct did not meet the requirements of Regulatory Guide (RG) 1.29. The licensee had stated that prior to fuel load all HVAC ducts would be walked down to determine conformance to R.G. 1.29. A seismic interaction study was implemented by Sargent and Lundy to verify the adequacy of the supports on HVAC ducts. The results of the study required that one HVAC hanger be reworked in the upper cable spreading room area. The licensee has completed walkdown of all other safety related plant areas.

(Closed) Noncompliance (454/83-54-02): It was previously identified that identification of apparent separation violations between Class 1E and non-Class 1E conduits were not being verified or documented. Consequently, several instances were observed wherein the one inch minimum requirement for conduit separation was not maintained. The licensee has incorporated the electrical separation requirement for conduit separation into Hatfield Procedure 20, revision 14. The procedure requires that a minimum separation of one inch be established and violations will be documented on a Conduit Separation Notification. Additionally, the electrical contractor's checklists include this acceptance criteria.

(Closed) Unresolved Item (454/83-54-03): It was previously identified that a nonconformance report (NCR) apparently had been improperly dispositioned. Records indicated that the licensee had exceeded the maximum allowable pull tension recommended by Sargent and Lundy with the use of an 18" pulling guide. The surveillance report which documented the re-pull of the cable, stated that an 18" pulling guide was used. However, discussions with the QC inspector who witnessed the re-pull of the cable stated that no pulling guide was used and that the surveillance report was in error. This matter is closed.

(Open) Unresolved Item (454/83-60-01): It was previously identified that receipt inspection reports contained numerous documentation omissions pertaining to the quality acceptance criteria for cables. The inspector observed that dimensional data pertaining to insulation and jacket thickness, cable insulation thickness requirements, and high voltage DC tests were not documented, although Sargent and Lundy had accepted the receipt inspection reports. The licensee indicated that there is no requirement in the applicable S&L specification for the submittal of such data. It appears that documented verification of these quality attributes needs to be clarified. This matter remains unresolved pending further resolution.

(Open) Noncompliance (454/83-60-03): This item involved incorrect connections to safety-related level transmitters where the high and low taps were reversed. The licensees' representatives in instrumentation/QA committed to do a 100% re-inspection of all level and flow transmitter connections in containment and the auxiliary building. The licensee has found that approximately fifteen percent of the transmitters had connections that were reversed. Re-inspection of the instruments in containment is complete but work in the auxiliary building is continuing.

(Closed) Open Item (454/84-03-03): It was previously identified that two Class 1E cables in junction box JB959R connected to transmitters 1FT-SI053 and 1LT-0518 were found to be submerged in water. Since the two cables had been terminated in the junction box it was a concern that moisture could affect the operation of the transmitters. However, there appears to be no degradation of the cables as evidenced by signal indication from the transmitters in the control room.

(Closed) Open Item (454-84-14-01): It was previously identified that qualifying documentation for the interrupting capability of circuit breakers for the 480 volt substation (Spec. F-2752) and the DC distribution center (Spec F-2822) was not available at the plant site. The two

Sargent and Lundy specifications mentioned above required the vendor to submit test and inspection reports to certify the short circuit interrupting capability of each ampere size/ frame size circuit breaker. The licensee provided documentation that qualifies the short circuit interrupting capabilities of the subject breakers.

(Closed) Unresolved Item (454/84-03-04): It was previously identified that oil was leaking into the limit switch compartment through the oil seals. A nonconformance report (NCR) was issued and the proposed corrective action to prevent recurrence was to make periodic inspections of the limit switch compartment and look for leaking seals. The problem identified in the NCR with softening and swelling of the insulation was determined by the cable manufacturer not to have been caused by leaking oil. The licensee has issued a speed letter informing the electrical contractor to wipe the cables prior to termination.

(Closed) Unresolved Item (454/84-17-05): It was previously identified that certain conductor splices lacked QA documentation. Terminations, splices and other QC verification activities are documented on form HP-118, Cable Termination Inspect Report. The inspector observed that although, conductors were spliced in the field, some lack QC verification documentation. The licensee has stated that the Hatfield Procedures does not require that splices be inspected or that the QC inspection of the splice be documented. This does not appear to be consistent with QA/QC requirements of activities affecting quality. Further investigation of this matter by another inspector identified deficiencies in the surveillance performed to verify the adequacy of the conductor splices. The surveillance performed by the licensee identified a 15% failure rate of a random sample of about 300 conductor splices. It appears the licensee failed to perform additional surveillances or to perform further corrective action to disposition the remaining splices in the plant. This item will be followed in a separate NRC report (454/84-27).

3. Licensee Action on 10 CFR 50.55(e) Items

(Closed) 50.55(e) (454/80-01-EE): "Intermittant Contact Operation of W-2 Switches." The manufacturer (Westinghouse) of the switches performed examinations on switches known to have experienced intermittant contact operation after installation. Internal contamination of the switch contacts was apparently the cause of the problem. The manufacturing process for the switches was revised to include cleaning steps to reduce contamination during assembly. Westinghouse issued Field Change Notice (FCN) CAEM-10653 to initiate corrective action and develop procedures to ensure proper installation of the W-2 switches. Replacement of all W-2 switches in Class 1E circuits was completed in February 1984, in addition, QC inspections were performed and documented.

(Closed) 50.55(e) (454/82-02-EE): "Synchroscope Wiring Error." During the performance of the diesel generator 1A (DG1A) preoperational test, DG1A was running and supplying power to the 4KV 141 bus which was isolated from the remaining 4KV system. In order to achieve additional electrical load, bus 141 was electrically switched to interconnect with bus 241. During synchroization of the two buses, DG1A and its interconnecting

breaker tripped and the diesel generator shutdown. A subsequent investigation revealed that DG1A was closed sixty degrees out of phase due to the wrong phase (B/C instead of A/B) connection to a reserve potential transformer. The 4160-120 volt potential transformer primary connection is shown in Sargent & Lundy (S&L) drawing 6E-1-4004B to be connected to the A/B phase. The inspector verified that the connection to the potential transformer was to A/B phase as required. In addition, the Operational Analysis Department (OAD) has revised their procedure to include proper phasing of bus potential transformers.

(Closed) 50.55(e) (454/82-03-EE; 455/82-03-EE): "Fusible Links in Curtain Type Fire Dampers." It was previously identified that certain curtain fire dampers supplied for Byron may not close when the fusible link separates. These particular fire dampers had type "C" fusible links which had been formed into a channel cross section with the legs of the channel cross section being about 90° to the main body of the fusible link. When the link separated, the blade stack did not always fall into place. Reliable Sheet Metal Works, Inc. issued NCR No. 041 to implement corrective action which involved replacement of the 90° formed "C" fusible links with 45° formed "C" links. Records indicate that all curtain type dampers were QC inspected to verify that the correct fusible links with the Underwriters Laboratory stamps were installed.

(Closed) 50.55(e) (454/83-10-EE: "Battery Charger Input Breakers." Battery chargers were received with the wrong type of shunt trip coil on the main input AC breaker. The deficiency was discovered during testing of the battery chargers and affects Square D type KHL 480V 3 phase breakers. The shunt type coils are 120V AC on a 125V DC circuit and should be DC coils. The new 125V DC trip coils were supplied by the Vendor and were installed by the electrical contractor. Nonconformance report No. F-826 documents the deficiency and was closed out on December 1, 1983.

(Closed) 50.55(e) (454/83-11-EE): "Anaconda Flexible Conduit Split." During Hot Functional Testing (HFT), the jacket of the anaconda type NWC flexible conduit used inside containment was discovered to be split open on several installations. The flexible conduit provides a liquid tight jacket connection to Class 1E circuits. The cause of the problem was determined to have been caused by excessive bending in combination with exposure to high temperatures during HFT. The subsequent corrective action was to have the exposed conduit jacket, covered by T-35 jacket tape. Installation of the tape was performed in accordance with the electrical contractor's site instruction. Records indicate that QC inspections were performed on all Class 1E circuits.

(Open) 50.55(e) (454/83-09-EE; 455/83-09-EE): "Process Protection System Heat Sinks and Relays" Failures in the adhesive bond were determined to occur in the heat sink assembly on loop power NLP cards. Deficiencies in the adhesive bond can cause the separation of the heat sink plate such that it may fall off of the printed circuit board. A second deficiency involved contact bounce experienced during seismic testing in relays of the temperature test NTC card. Records indicate that replacement of the heat sinks on the NLP cards is complete. The problem with relays on the NTC cards still exists. Westinghouse issued Field Change Notice (FCN)

CAEM-10756 which implemented a temporary change to correct the problems. The input test relays in the Westinghouse 7300 series NTC cards were temporarily bypassed by the addition of jumpers. Westinghouse has not determined whether the addition of the jumpers to the cards will be a permanent solution. This item remains open pending a permanent solution to this problem.

(Closed) 50.55(e) (454/83-12-EE): "Westinghouse A-200 MCC's Overload Blocks". During testing of Westinghouse Motor Control Centers (MCC's) it was discovered that some of the motor starters were tripping outside of the acceptable criteria specified by Westinghouse instructions. It was determined that deficiencies existed in the A-200 MCC ambient compensated thermal overload relay blocks for sizes 0, 1, and 2 starters. Records indicate that all overload blocks in assigned cubicle compartments on Unit 1 were either tested or replaced. Testing was performed in accordance with maintenance procedure BHP-4200-2B and QC inspections performed to verify that the time required to trip the thermal overload relays met the manufacturer's acceptance criteria.

4. Licensee Action on Bulletins

(Closed) Bulletin (454/78-04-BB): Environmental qualification of certain stem mounted limit switches inside reactor containment. During a review by the manufacturer (Westinghouse) of the seismic and environmental qualifications of the electrical circuitry used for valve operation, certain stem mounted limit switches associated with various safety related valves were found not to be environmentally qualified for loss of coolant accident (LOCA) conditions. The problem limit switches were determined to be the Namco EA-170 models. Implementation of corrective action was accomplished by issuance of Field Change Notices (FCN's) numbers, CAEM-10625, CAEM-10625, CAEM-10627, CAEM-10631, CAEM-10690, CAEM-10712, CAEM-10713, CAEM-10732, and CAEM-10750. Work to replace Namco model EA-170 with model EA-180 limit switches on air operated valves and motor operated valves has been completed in containment.

(Closed) Bulletin (454/80-20-BB): "Failures of Westinghouse Type W-2 Spring Return to Neutral Control Switches" This bulletin was issued as a result of a deficiency determined to be caused by intermittent contact operation of W-2 switches (refer to 50.55(e) 80-01 above). This problem was identified when the neutral contacts of a switch failed to close although the switch was in the neutral position (or "Auto Start"). The licensee has removed and changed all W-2 switches that control safety related operations. The change to the new switches manufactured to the revised process appears to constitute corrective action.

5. Licensee Action on Circulars

(Closed) Circular (454/78-08-CC; 455/78-08-CC): "Environmental Qualification of Safety Related Electrical Equipment at Nuclear Power Plants." This circular required the licensee to examine installed safety-related electrical equipment, and to ensure appropriate documentation of its qualifications to function under postulated conditions. However, the requirements set forth by Bulletin 79-01 and its supplements are more

stringent. Additionally, environmental qualification requirements of equipment are made part of the conditions for an operating license in the licensee's Safety Evaluation Report (SER). The requirements of this circular have been superseded and is therefore not applicable.

6. Observation of Electrical Work Activities

During this inspection the inspector reviewed Hatfield inspection records for electrical cable, terminations and equipment. No apparent deficiencies were found in cable and termination records.

Hatfield equipment installation inspection records 1 thru 100 form HP 121 did not identify S&L drawings and revisions used by the inspector to verify completion of activities affecting quality. With the lack of this information, quality records 1 thru 100 provided no evidence of these activities being verified in accordance with applicable acceptance criteria.

HECo Procedure #1, Revision 11, 5.15d references the need for drawing and revisions to be indicated on inspection checklists. Procedure #12, Revision 7, Activities 5.1.7, 5.1.8, 5.1.10 and 5.1.11 require installations to be completed in accordance to S&L installation drawings.

10 CFR 50, Appendix B, Criterion 17 requires inspection records to furnish evidence of activities affecting quality and requires as a minimum for the record to identify the acceptability of activities performed.

The licensee was informed that this was an example of an item of non-compliance with Criterion XVII of 10 CFR 50, Appendix B, failure to establish adequate documented evidence of qualification or acceptability of activities affecting quality on inspection records (50-454/84-23-01).

7. Instrumentation - Observation of Work Activities

a. Instrument Panel Installation

The inspector observed the completed as-built installation of safety related instrument racks. The inspector reviewed applicable specifications and work procedures to determine whether the instrument panels were being installed in accordance with licensee commitments. The inspector reviewed installation records and verified location and orientation for the following instrument racks.

Instrument rack 1PL50J was determined to be installed in accordance with Powers-Azco-Pope drawing No. M-160-1LT-501, revision 0. Records indicate the instrument panel was QC inspected on September 22, 1980.

Panel No. 1PL75J was determined to be installed in accordance with Powers-Azco-Pope drawing M-182-1LT-503. Records confirm that instrument components were properly installed and the required inspections performed. During verification of the as-built installation of instrument panel 1PL75J, the inspector observed

that although the rack had been installed with 1/4" concrete expansion anchors, two of the bolts were 3/8" and one of the bolts was missing from the installation. The inspector determined that this apparent discrepancy had been identified by the instrument contractor and documented on FCR 19188. NCR's #189 and #191 were also issued and S&L approved the disposition on October 12, 1983.

A separate problem involved the use of 1/4" concrete expansion anchors to install the instrument racks. The 1/4" anchor bolts are torqued to 7 foot pounds and the concern is whether the as-built installation is in accordance with the seismic analysis testing of the instrument panel. This item is unresolved pending further review (50-454/84-23-02A).

Panel number 1PL56J was observed to be installed in accordance with Powers-Azco-Pope Drawing No. M-180-1LT-556. Records confirm that the racks were properly installed including anchoring and that the required inspections were performed. The installation of this rack appeared to be inconsistent in that three of the legs of the rack were installed with 1/2" anchor bolts and the fourth leg with 1/4" bolts. The concern with the installation of this rack is similar to the issue mentioned above. This matter is also considered unresolved (50-454/84-23-02B).

The installation of Panel No. 1PL69J was verified to be installed in accordance with Powers-Azco-Pope drawing No. M-161-1LT-513. Details of the drawing appear to be sufficient to verify installation. Installation of the rack was QC inspected on September 25, 1980.

Panel No. 1PL69J was verified to be installed in accordance with drawing No. M233-1LT-517 records confirm that proper instrument components were properly installed and that the required inspections were performed.

No items of noncompliance or deviations were identified.

b. Bistable Setpoint Verification

The inspector verified set points of signal comparators associated with selected system loops. The signal comparators bistable set points were compared against their respective calibration sheets to determine whether the required and the as left settings were within tolerance and in accordance with the field setting. The following bistables associated with a system loop were checked to determine set point values:

Pressurizer Pressure Protection II - 1PB-056A, 1PB-0456B and 1PB-0456C

Refueling Water Storage Tank Level - 1LB-0930A and 1LB-0930C

Steam Generator Narrow Range Level - Loop 1A and 1D - 1LB-0556B, 1LB-0556, 1LB-0559 and 1LB-0559B.

Pressurizer Level Protection I - 1LB-0459A

Steam Generator Narrow Range Level - Loop 1B and 1C - 1LB-0557, 1LB-0557A, 1LB-0557B, 1LB-0558, 1LB-0558A and 1LB-0558B

No items of noncompliance or deviations were identified.

c. Logic Diagram Loop Verification

The inspector reviewed the as-installed configuration of logic cards for system loops installed in control panels. The inspector verified that instrument components such as loop power supplies, relay cards, and signal comparators were installed per their respective loop schematic diagram. The following drawings were reviewed:

Loop Schematic Diagram Pressurizer Pressure Protection II, Drawing 6E1-4031RY02, Revisions E.

Loop Schematic Diagram Pressurizer Level Protection I, Drawing 6E-1-4031RY05, Revision D.

Loop Schematic Diagram Refueling Water Storage Tank, Drawing 6E-1-4031SI01, Revision E.

Loop Schematic Diagram Steam Generator Narrow Range Level - Loop 1A and 1 D, Drawing 6E-1-4031FW24, Revision E.

Loop Schematic Diagram Steam Generator Narrow Range Level - Loop 1B and 1C, Drawing 6E-1-4031FW25, Revision E.

No items of noncompliance or deviations were identified in this area.

d. FSAR Logic Diagram Verification

The inspector reviewed selected Byron FSAR logic diagrams to determine whether the licensee's schematic reflect the latest as-built initiation logic. The following FSAR logic diagrams were verified with their respective schematics:

FSAR figure 7-6-4, Safety Injection Recirculation Sump Isolation Valves, logic diagram agrees with schematic diagram No. 6E-1-4030-SI14, "Containment Sumps 1A and 1B Isolation Valves No. 1SI8811A."

FSAR figure 7.6-3, Functional Block Diagram of Accumulator Isolation Valve, was verified to be in accordance with drawing No. 6E-1-4030SI11.

Logic Diagram for inner RHR Isolation Valve, in FSAR figure 7.6-2 is consistent with schematic diagram, No. 6E-1-4030-RH04. FSAR figure 7.6-1, Logic Diagram for outer RHR Isolation Valve is in accordance with drawing No. 6E-1-4030RA05.

No items of noncompliance or deviations were identified.

8. Review of QA Records

- a. The inspector reviewed the instrument contractor's (Powers-Azco-Pope) nonconformance reports (NCR's) for proper review, closure and for corrective action to prevent recurrence. Records were determined to be legible, complete and reviewed by QC personnel, additionally nonconformance reports included resolution. The following Powers-Azco-Pope NCR's were reviewed:

NCR 122, issued February 8, 1982, closed March 31, 1982
NCR 125, issued February 10, 1982, closed April 9, 1982
NCR 130, issued March 30, 1982, closed May 17, 1982
NCR 132, issued April 21, 1982, closed June 3, 1982
NCR 138, issued June 23, 1982, closed July 15, 1982
NCR 139, issued June 25, 1982, closed October 13, 1982
NCR 143, issued August 19, 1982, closed March 7, 1984
NCR 144, issued September 1, 1982, closed April 18, 1983
NCR 145, issued September 1, 1982, closed January 3, 1983
NCR 146, issued September 7, 1982, closed October 13, 1982
NCR 147, issued September 9, 1982, closed January 10, 1984
NCR 148, issued September 30, 1982, closed February 28, 1984
NCR 149, issued October 5, 1982, closed December 13, 1982
NCR 151, issued November 10, 1982, closed October 17, 1983
NCR 152, issued November 10, 1982, closed October 17, 1983
NCR 153, issued November 22, 1982, closed January 3, 1984
NCR 154, issued November 23, 1982, closed October 12, 1983
NCR 155, issued November 22, 1982, closed January 3, 1983
NCR 156, issued November 30, 1982, closed March 1, 1983
NCR 216, issued October 17, 1983, closed November 22, 1983
NCR 219, issued October 25, 1983, closed December 12, 1983
NCR 230, issued November 30, 1983, closed December 13, 1983

No problems were identified in this area.

b. Hydrostatic Test Records

The inspector reviewed reports of hydrostatic testing of instrument sensing lines. Hydrostatic testing is performed in accordance with Powers-Azco-Pope's hydrostatic Procedures, FP-10, revision 7. This procedure delineates controls and documentation requirements for hydrostatic testing. The inspector verified that the following requirements are being accomplished for each hydrostatic test:

- . Hydrostatic test calculation
- . Instrument Piping Boundaries diagram
- . QA release for construction
- . Pittsburgh Testing Laboratory (PTL) testing before of test pressure gauges and the calibration report
- . PTL verification of gauge accuracy testing after hydrostatic testing.

The inspector verified that the following tests were performed in accordance with Powers-Azco-Pope, procedure FP-10:

<u>Test No.</u>	<u>System</u>	<u>Design Pressure</u>
#215	Feedwater	1185 psig
#216	Reactor Coolant	2485 psig
#217	Reactor Coolant	2485 psig
#219	Reactor Coolant	2485 psig
#223	Auxiliary Feedwater	1750 psig
#224	Auxiliary Feedwater	1750 psig
#229	Auxiliary Feedwater	1750 psig
#233	Component Cooling	150 psig
#234	Component Cooling	150 psig
#240	Chemical Volume	20 psig
#241	Chemical Volume	20 psig

During a review of the hydrostatic tests, the inspector observed that numerous pressure gauges were found out of calibration when tested before and after a test. The licensee as a matter of precaution uses two pressure gauges during hydrostatic testing. The inspector verified that no test was voided as a result of both pressure gauges being out of calibration.

No items of noncompliance or deviations were identified.

c. Pneumatic Test Records

The inspector reviewed records pertaining to pneumatic testing of safety related instrument lines. Pneumatic testing of instrument sensing lines is controlled by Powers-Azco-Pope, Pneumatic Test Procedure, FP-14, revision 3. Records indicate that the following pneumatic tests were performed in accordance with procedure FP-14:

<u>Test Report</u>	<u>System</u>	<u>Test Pressure</u>
# 8	Pressurizer Level	120 psig
#11	Pressurizer Level	750 psig
#15	Diesel Oil	60.5 psig
#24	Essential Service Water	122 psig
#25	Diesel Generator N2	190 psig
#28	Diesel Generator N2	115 psig
#36	Diesel Generator N2	115 psig
#37	Diesel Generator N2	57 psig

No problems were identified in this area.

d. Measuring and Test Equipment Records

The inspector reviewed the instrument contractor's control of measuring and test equipment. Measuring and test equipment is controlled by the contractor's procedure No. FP-11, revision 9 and provides instructions to assure that only properly controlled and calibrated measuring and test equipment is utilized for installation, testing and inspection. Records for the following torques wrenches (TW) and

pressure gauges (PG) which are calibrated by the Pittsburgh Testing Laboratory (PTL) were reviewed: TW-3, TW-10, TW-11, PG-4, PG-11, PG-12, PG-25, PG-26, PG-27 and PG-28.

During verification of control of measuring and test equipment the inspector observed that six pressure gauges which had out of calibration due dates, were in the "calibrated ready for use" shelf instead of the "awaiting calibration" shelf. The inspector further reviewed this area to determine whether test equipment with expired calibration due dates had been used in any of the hydrostatic or pneumatic tests performed at Byron. There is no evidence of this potential occurrence since the calibration due dates are documented on all test reports.

No items of noncompliance or deviations were identified.

e. Instrument Calibration Records

The inspector reviewed calibration and instrument setting data for selected safety related instrument loops. Records confirmed that proper calibration and instrument settings were made as specified. In addition, measuring and test equipment was verified to have current calibration due dates. The following procedures and instrument associated with a system loop were verified:

Pressurizer Water Level Protection Loop Procedure BIS 3.1.1.1-210

- . Pressurizer Level Power Supply - 1LQY-0459
- . Pressurizer Hi Level Alarm - 1LB-0459A
- . Pressurizer Level Vertical Meter - 1LI-0459A
- . Pressurizer Level Computer Input Pad - 1LD-0459
- . Pressurizer Level E/E Signal Isolation - 1LY-0459A
- . Pressurizer Level E/I Converter - 1LY-0459
- . Pressurizer Level Vertical Scale Indicator - 1LI-0459B
- . Pressurizer Level D/D Cell Transmitter - 1LI-0459

Pressurizer Pressure Protection Channel I-Procedure BIS-3.11.1-206

- . Pressurizer Pressure with Isolation - 1PGY-0455
- . Pressurizer Pressure Computer Input Pad - 1PD/045A
- . Pressurizer Pressure Vertical Scale Meter - 1PI-0455A
- . Pressurizer Pressure E/I Converter - 1PY-045A
- . Pressurizer Pressure Vertical Scale Meter - 1DI-0455B
- . Pressurizer Pressure Transmitter - 1PT-0455

No problems were identified in this area.

f. Ovality Surveillance Reports

The inspector reviewed ovality surveillance reports of cold bending of instrument sensing lines from June 29, 1982 to the present. Surveillances are performed monthly and in accordance with Powers-Azco-Pope procedure, Cold Bending of Pipe and Tube, procedure No. FP-12. During verification of instrument sensing line surveillance ovality

reports, the inspector observed that although the measured values for several bends did not exceed the maximum allowable ovality, the ovality figures tended to be relatively high. The inspector questioned the need not to do further surveillance on instrument sensing lines which connect level transmitters 1LT-0503 and 1LT-537. The instrumentation contractor, as part of the QA program, normally performs monthly surveillances on instrument lines that have been recently cold bended but agreed to measure ovality on the instruments in question. The inspector accompanied Powers-Azco-Pope personnel and randomly selected about eight bends from two pairs of instrument lines connecting the two level transmitters mentioned above. During the surveillance, two half inch schedule 80 pipe bends out of eight measured ovality greater than the eight percent specified by procedure FP-12. The licensee took prompt corrective action as evidenced by Powers-Azco-Pope issuing NCR #289 which required the contractor to perform additional ovality inspections on the remaining pipe bends and to rework all the bends that exceed eight percent.

The instrument contractor subsequently checked thirty-six bends on sensing lines connecting transmitter 1LT-503 and found that bend 32 had an ovality of 8.2%. Additionally, twenty-three bends were checked on instrument lines to transmitter 1LT-537 and bend 21 had an ovality of 8.3%. A letter from Powers-Azco-Pope and the licensee's lead mechanical engineer stated that all bends found to exceed 8% ovality will be reported on the NCR for CECO/S&L evaluation. The licensee was in the process of reworking the bends which exceeded the maximum allowable ovality. The corrective action appears acceptable.

No other issues were identified in this area.

9. Review of Electrical QA Records

Panel Meter Calibration Records

The inspector reviewed calibration setting data pertaining to panel mounted meters on Class 1E control panels. Records confirmed that proper calibration and meter settings were made as specified in accordance with, Electrical Construction Test Procedure #22, Electrical Instruments, revision 2. Acceptance criteria and the associated accuracy as a percent of full scale (span) of each individual meter was noted on each of the calibration data sheets. In addition, measuring and test equipment used in the calibration of the panel meters were verified to have current calibration due dates. The following meters identified by meter number were verified to be calibrated in accordance with, Electrical Procedure #22: 1I-DG001, 1JI-DG002, 1JI-DG003, 1VI-DG003, 1VI-DG004, 1EI-DG005, 1SI-DG008, 1II-DG009, 1JI-DG010, 1JI-DG011, 1VI-DG012, 1EI-DG013, and 1SI-DG016. The following meters were identified by function: Diesel Generator Bus 141 cubicle 6 ammeter, Diesel Generator 1A AC ammeter, Diesel Generator 1A voltameter, Diesel Generator 1A Frequency meter, Diesel Generator RPM meter, Bus 142 cubicle 6 ammeter, Diesel Generator 1B ammeter, Diesel Generator 1B voltmeter and Diesel Generator RPM meter 1B.

During review of the panel meters it was determined that meters were not being calibrated on a regular scheduled basis. Further, panel meters in the field, contain calibration dates but no calibration due date. The licensee informed the inspector that the meters are calibrated eighteen months prior to a hot functional or pre-operational test. Although, panel meters did not contain calibration due dates, no panel meter was found to have exceeded the eighteen month schedule before a test.

No items of noncompliance or deviations were identified.

10. 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. An unresolved item disclosed during the inspection is discussed in Paragraph 7.

11. Exit Interview

The inspector met with licensee representatives (denoted under Persons Contacted) on April 13, 1984 and April 26, 1984 at the conclusion of the inspection. The inspector summarized the scope and findings of the inspection. The licensee representatives acknowledged the findings reported in previous paragraphs.