

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-456/84-23(DRS); 50-457/84-22(DRS)

Docket No. 50-456; 50-457

License No. CPPR-132; CPPR-133

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

Facility Name: Braidwood Station, Units 1 & 2

Inspection At: Braidwood Site, Braidwood, Illinois

Inspection Conducted: August 20-24 and 27-31, 1984

Inspectors: R. S. Love *R. S. Love* 10/10/84  
Date

R. Mendez (August 22-24, Only) 10/10/84  
*R. Mendez* Date

E. Christnot *E. Christnot* 10/10/84  
Date

K. Tani *K. Tani* 10-10-84  
Date

Approved By: *C. C. Williams*  
C. C. Williams, Chief 10-10-84  
Plant Systems Section Date

Inspection Summary

Inspection on August 20-31, 1984 (Report No. 50-456/84-23(DRS); 50-457/84-22(DRS))

Areas Inspected: Routine, unannounced inspection on licensee actions on previous inspection findings, 10 CFR 50.55(e) reports, circulars, allegations, electrical cable installation and terminations; and installation of instrumentation sensing lines. This inspection involved a total of 260 inspection-hours onsite by 4 NRC inspectors including 6 inspection-hours during off-shifts.

Results: Of the areas inspected, no items of noncompliance or deviations were identified.

8411060082 841011  
PDR ADOCK 05000456  
PDR  
Q

## DETAILS

### 1. Persons Contacted

#### Commonwealth Edison Company (CECo)

- \*M. J. Wallace, Project Manager
- \*D. L. Shamblin, Project Construction Superintendent
- \*T. E. Quaka, Quality Assurance Superintendent
- \*L. M. Kline, Project Licensing and Compliance
- \*C. W. Schroeder, Project Licensing and Compliance Superintendent
- \*D. L. Jones, PCD Instrument Engineer
- \*S. P. Johnson, PCD Engineer
- \*E. R. Netzel, Quality Assurance Supervisor
- \*J. W. Gieseke, Construction Supervisor
- \*R. J. Farr, Project Mechanical Supervisor
- \*C. Mennecke, Project Electrical Supervisor
- \*L. J. Tapella, Project Construction Engineer
- \*M. P. Vrla, Quality Assurance Engineer
- \*R. Waniski, Quality Assurance Engineer
- P. L. Barriss, Licensing Engineer
- S. Hunsader, Quality Assurance Supervisor
- C. Gray, Structural Supervisor

#### Comstock Engineering, Inc. (LKC)

- \*I. F. Dewald, Quality Control Manager
- \*J. Klena, Project Engineer
- \*K. Munson, Cable Engineer
- F. Rolan, Project Manager
- S. Saver, Document Control Supervisor
- \*R. Seltmann, Quality Assurance Engineer
- J. Sumrow, Quality Assurance Engineer
- N. Kimble, Quality Control Inspector
- L. Seese, Quality Control Assistant Manager

#### Phillips, Getschow Company (PGCo)

- \*T. G. O'Connor, Site Manager
- \*J. R. Stewart, Project Engineer
- \*M. Knaff, Instrumentation Engineering Group Supervisor
- \*J. Carlson, Quality Control Supervisor
- S. Goryl, Lead Field Engineer
- J. Devine, Area Superintendent, Instrumentation
- W. McDonough, Quality Control Technician
- L. Butler, Assistant Quality Control Office Supervisor

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

\*Denotes those present at the exit interview on August 31, 1984.

## 2. Allegations

### Background

Comstock Engineering Company has a policy to interview all employees terminating their employment with LKC at Braidwood. On March 9, 1984, the LKC Assistant Quality Control Manager and an LKC Quality Assurance Engineer interviewed a QC inspector who was terminating his employment with LKC. During this interview, the QC inspector provided a list of ten (10) concerns, which are discussed below. The subject inspector was employed by LKC on December 5, 1983 and was qualified to perform weld inspections. A copy of the inspector's concerns was provided to the licensee who in turn provided the list of concerns to the NRC's Senior Resident Inspector at Braidwood. No examples were provided for any of the listed concerns. Following is the list of concerns provided by the QC Inspector, the licensee's actions, and the NRC's followup actions:

- a. Concern: There are numerous cases of reports misfiled. Also, there is more than one inspection report on many hangers, some accepting, some rejecting, and others reporting that no QC inspection is required.

Licensee Action: With respect to reports being misfiled, this item was identified during a CECO QA audit of LKC documentation/filing system. As a result of this audit, a Comprehensive Document Review Program was established and implemented. After further evaluation, the Region III office was notified on January 31, 1984 of a potential 10 CFR 50.55(e) with the LKC records file. The corrective measures which provide improvements to the LKC document system was presented to the Region III Staff on November 3, 1983 and on December 20, 1983 during the Enforcement Conference in the Region III office.

With respect to the multiple inspection reports on hangers, this is a common occurrence and is in accordance with LKC procedures. Following are examples where two or more inspection reports could be initiated for the same hanger:

- . One or more partial inspections and a final inspection could be performed on the same hanger by LKC.
- . If during a normal acceptance inspection, the LKC inspector identifies a discrepancy, this discrepancy would be documented on an inspection report (rejecting the hanger) and on a Nonconformance Report (NCR) or Inspection Correction Report (ICR). After corrective action is taken, closure of the NCR/ICR is documented on an inspection report (accepting the hanger, if acceptable) and closes the NCR/ICR if the item is acceptable.
- . After LKC QC has accepted the subject hanger, a third party (PTL) performs a sample overinspection, thus, a second (minimum) inspection report would be on file. Pittsburgh Testing Laboratory (PTL) could also reject the hanger for cause. In a given situation, there could be two or more LKC inspection reports and two or more PTL inspection reports on the same hanger.

With respect to inspection reports stating that no QC inspection is required, this is also a common occurrence and in accordance with LKC procedures. This situation occurs when a non-safety-related hanger is installed in a seismic category I building. Per project requirements and LKC procedures, visual weld inspection may be required, however, QC inspection is not required to inspect for location, configuration, material traceability, etc.

#### NRC Followup

With respect to reports being misfiled, the inspector concurs with the licensee's action. This item is being tracked by Region III for proper implementation of the Comprehensive Document Review Program and subsequent correction of the discrepancies identified. As of August 31, 1984, the document review is essentially complete, however, the identified discrepancies have not all been corrected. Region III identified specific documentation problems in Inspection Report 456/83-18 and 457/83-17. The generic problem is being tracked by the potential 10 CFR 50.55(e) report (456/84-01-EE; 457/84-01-EE) filed by the licensee.

With respect to the multiple inspection report, the various examples provided by the licensee were observed by the Region III inspectors during this and previous inspections. As stated by the licensee, the initiation of more than one inspection report on a given item is a common occurrence and is in accordance with LKC procedures. Multiple inspection reports may be found in the area of cable pulling, (partial pulls, pull backs, rejected pulls, etc.), cable terminations (determinations, reterminations, rejects, reworks, etc.) and in other LKC work activities.

#### Conclusions

With respect to reports being misfiled, this concern is substantiated, however, it had been previously identified and is being tracked by LKC, CECo, and Region III.

With respect to multiple inspection reports on a given hanger, this concern is substantiated, however, this is in accordance with LKC procedures.

#### b. Concern

There are corroded hangers, cable pan, conduit ground straps, and junction boxes in the power block.

#### Licensee Action

During normal plant construction, a certain amount of corrosion (rust) is expected. When an item is welded and inspected, there is a delay before the painting contractor is released to paint in a given area. Because of this delay, the welds will oxidize. Prior to painting, this oxidation/rust is removed.

In addition to this normal oxidation, it has been identified that fireproofing material (pyrocrete) causes metal deterioration when applied to non-ferrous or stainless steel material. During a CECO audit (September 26 thru October 5, 1983), it was observed that the fireproofing installation contractor was not using specified precautions (cover/tape non-ferrous and stainless steel items) when applying fireproofing material. As a result of this finding, LKC was directed to inspect their installation, remove fireproofing from all non-ferrous/stainless steel items and document all findings on a nonconformance report. LKC completed their walkdown on December 22, 1983 and documented their findings on NCR 1626, dated December 23, 1983. As of August 31, 1984, this NCR is still under evaluation by CECO.

#### NRC Followup

The Region III inspector reviewed the licensee action and concurs that oxidation of carbon steel items will occur during the normal construction activities. Region III has an open item (456/83-18-07) on hold down welds inside of electrical equipment that had not been painted and are oxidized. Action is being taken by the licensee to have these welds cleaned and painted. During this reporting period, the licensee received additional information to assist them in providing a disposition to NCR 1626. The inspection for rust, unpainted welds, proper closure of NCRs/ICRs is an inspection attribute under the NRC's module inspection program and this item will be inspected during subsequent inspections.

#### Conclusions

This concern is substantiated, however, oxidation of carbon steel is expected. The licensee has a program in place to remove the oxidation and paint the area. With respect to the metal deterioration caused by the improper application of fireproofing material, this discrepancy is documented on NCR 1626.

#### c. Concern

Hangers mislabeled or misplaced and conduits are installed on the wrong hangers.

#### Licensee Action

It appears that part of this concern was generated during the inspector's assignment to the welding fab shop. After fabrication, hangers are assigned a unique number based on their intended location in accordance with LKC procedure 4.9.3. It should be noted that two or more hanger may be fabricated from the same design drawing, however, each of these hangers would have a unique number. After assignment to the field, some hangers were diverted to more critically needed locations where the same design is utilized. The unique number provides the required material traceability, no matter where it is installed. Proper configuration, connection detail, materials, etc. are verified by the

LKC QC inspectors. To prevent recurrence and to assist in planning the fab shop work activities, all pre-fabricated hangers that were stored in the power block were removed and placed in a lay-down area near the LKC office. These hangers are now issued on an as-needed basis.

With respect to conduits being installed on the wrong hangers, 14 NCRs were prepared between December 1, 1983 and March 1, 1984 to document conduits being installed on wrong hangers. This fact was identified by a CECO trend analysis dated January 3, 1984 and reaffirmed in a LKC trend analysis dated March 16, 1984. It was determined that the root cause was field personnel, engineering and construction, not following LKC procedure 4.2.3, "Field Problem Reports". Engineering and construction personnel were re-trained in procedure 4.2.3.

#### NRC Followup

The inspector reviewed the licensee's action and found it to be adequate. During this and previous inspections, the inspectors verified that the hangers (conduit and cable tray) were in the proper location, had the correct configuration, proper material utilized, and the material was traceable. During this inspection, the inspector was provided two examples where the wrong numbered hanger was installed. The inspector verified that the hanger was of the proper design (configuration, material size, correct connection detail) and by review of records, determined that material traceability was maintained. With respect to the conduits being installed on the wrong hangers, the inspector reviewed the two trend analyses and concluded that the licensee came to the correct conclusions. During a review the training records, the inspector observed that 82 LKC engineering and construction personnel were retrained to Procedure 4.2.3 on May 15, 16 and 17, 1984. The inspector also reviewed LKC NCRs 1815 thru 3110 and did not observe any NCRs where conduit was installed on the wrong hanger, indicating that the training was effective.

#### Conclusion

This concern was substantiated, however, (1) although the hangers did not have the correct number, they were of the proper design and the material was traceable, (2) the cases where conduits were installed on the wrong hangers were documented on NCRs and adequate corrective action was taken by the licensee.

#### d. Concern

There is trash in cable pans and trays.

#### Licensee Action

This is an on-going problem during the construction of power plants. This problem had been identified by LKC QA during internal audit 84-02-28-02 which was conducted February 17-24, 1984, (concern received March 9, 1984). The requirements for proper housekeeping are addressed in LKC Procedures 4.3.19 (work procedure) and 4.8.19 (QC inspection procedure). The following actions were taken to prevent recurrence:

- Memo to CECo Project Electrical Supervisor from LKC Project Manager requesting enforcement of good housekeeping practices and protection of electrical cables in raceway by other contractors.
- Retrain LKC craft personnel on housekeeping procedure requirements, (Procedure 4.3.19).
- Establish a schedule to monitor cable pan cleanliness.
- Documentation review of craft and QC inspection related records.
- Retrain QC inspectors on housekeeping procedure requirements, (Procedure 4.8.19).
- Revise procedure 4.8.19 to establish inspection tracking system for housekeeping activities.

#### NRC Followup

The inspector reviewed the licensee action and found it to be generally adequate. The inspector reviewed the training records and determined that craft, foremen, general foremen and area managers were trained to Procedure 4.3.19 on March 9-12, 1984. The inspector also reviewed several monthly schedules, including August 1984, and reviewed foremen and QC inspection records to support the schedule. As of August 22, 1984, revised Procedure 4.8.19 had not completed the review and approval cycle, however, an inspection tracking system for housekeeping activities was in place and appeared to be working. During this reporting period the inspectors verified the routing of 10 power, 10 control and 15 instrument cables. During this verification program the pans were visually examined and it was observed that the cable pans were generally clean, i.e. dust and dirt were present but no items were observed that would be detrimental to the cables.

#### Conclusion

This item was substantiated, however, it had been previously identified by the electrical contractor and a program is in place for cleaning of cable trays. In addition, this is an inspection attribute prior to pulling safety-related electrical cables.

#### e. Concern

There is poor weld rod control.

#### Licensee Action

It is believed that this concern stems from LKC NCR 1833, dated February 15, 1984. During a tour of the plant, the NRC Senior Resident Inspector (SRI) observed 90 pieces of uncontrolled E308, E309 and E316 stainless steel welding electrodes in a LKC foreman's

desk. Each contractor paints the tips of their welding electrodes with a unique color. LKC paints their electrodes white and the electrodes observed by the SRI were painted a salmon color, indicated Phillips, Getschow controlled electrodes. The 90 electrodes were confiscated and turned over to the LKC Project Manager for followup. NCR 1833 was prepared to document the uncontrolled electrodes. The subject foreman was interviewed and provided a signed statement indicating that he had no knowledge as to how the 90 electrodes came to be in his desk. To prevent recurrence, the following steps have been or are being taken:

- . Craft were retrained in welding electrode control.
- . Welders were issued identification cards and these cards must be presented when withdrawing electrodes.
- . At the present time, LKC has two electrode issuing stations in the power block. It is planned to combine these two stations into one.
- . At the present time, it is permissible for the welders to keep their "rod caddies", (portable ovens) in their work areas overnight as long as the heater is energized. It is planned to have the rod caddies turned into the issue stations at the end of each shift.
- . Revise the applicable procedure to show above listed changes.

#### NRC Followup

The inspector reviewed the licensee's actions and found them to be adequate. During this reporting period, the inspector reviewed the implementation of welding electrode control by touring the LKC issue rooms (two in the power block and one in the LKC warehouse), interviewing the welding electrode issue men and observed welding electrodes being issued. Controls appeared to be adequate and personnel interviewed were aware of the procedure requirements. During a tour of the plant, it was observed that all rod caddies in safety-related areas had the heaters energized. While passing through the turbine building (non-safety-related), the inspector observed two non-safety-related rod caddies (Nos. T90 and T93) without their heaters energized. Both caddies contained E7018 electrodes and the electrodes were cold. A review of the rod issue slips attached to the caddies indicated that Phillips, Getschow welder Number 921 was issued E7018 electrodes in Caddy T93 on July 27, 1984. Caddy T90 had two rod issue slips attached. These slips indicated that Phillips, Getschow Welders 792 and 972 were issued E7018 electrodes in Caddy T90 on July 11 and 12, 1984. In that these caddies, T90 and T92, were identified (painted black) for use in non-safety-related areas only and were found in a non-safety-related area (turbine building, 401' elevation, between columns G-20 and J-20), this information was turned over to the licensee for followup. The inspector reviewed the draft procedure, (Storage, Issue, and Control of Welding Material) and provided his comments to the LKC Project Engineer. A schedule had been established for the review of this procedure by the LKC Procedure Review Group.



### Conclusion

This concern was substantiated, however, the licensee had documented the alleged weld rod control problem on NCR 1833 and has taken or initiated adequate corrective action.

#### f. Concern

There is poor control of in-process welding.

#### Licensee Action

There is no requirement for 100% in-process welding inspections. Comstock procedures require a Level II welding inspector to perform a minimum of 10 in-process welding inspection per week. This is being accomplished.

#### NRC Followup

To confirm the licensee's action statements, the inspector reviewed the inspection checklists for in-process inspections. It was observed that there were an average of 12 in-process welding inspections being performed per week. The inspector did not observe any weeks where less than 10 inspections were performed. To confirm that the inspectors were not selecting a small number of welders for inspection, the inspector performed a detailed review of inspection reports for two consecutive weeks. Twenty-five in-process welding inspections were performed during this two week period and there was no duplication of welders.

### Conclusion

This concern could not be substantiated.

#### g. Concern

There is poor control of stud welding.

#### Licensee Action

During an LKC Corporate QA audit, dated August 17, 1983, it was identified that stud welders were not being qualified in accordance with LKC Stud Welding Procedure 4.3.11. It was identified that the stud welders were being qualified by torque tests rather than the required 30° bend tests. The procedure was revised to clarify the requirements for stud welder qualifications. A review of LKC trend analysis for September 15, 1983, December 15, 1983, and March 15, 1984 indicate that there were no deficiencies identified in the area of stud welding.

#### NRC Followup

The inspector reviewed the LKC stud welding procedure against the requirements of AWS D1.1-1975 and found it to be adequate. In

general, at the start of each days welding activities, each stud welder shall be used to weld two studs to a test plate in the same general position (flat, vertical, overhead, sloping) and of similar thickness. After being allowed to cool, the test studs are then bent to an angle of 30° by striking the stud with a hammer. There should be no failures in the weld zone. For final inspection of threaded studs other than shear connections, at least one stud in every 100 shall be torque tested with a calibrated torque wrench to the values given in Figure 4.30.2 of AWS.

During this reporting period, there was no stud welding in-progress. A review of inspection reports and trend analysis indicates that the final product has been acceptable.

#### Conclusion

Except for the qualification of stud welding equipment, this concern could not be substantiated.

#### h. Concern

There is poor control of void drawings and field change reports (FCR), leading to lack of traceability for post inspection reports.

#### Licensee Action

LKC QA audit of March 6-9, 1984 identified problems in the area of document control. At the request of the LKC QC Manager, LKC QA conducted a followup audit on April 11-18, 1984. The following observations were made during the followup audit:

- . Procedures and drawings are being issued in a timely manner.
- . Void drawings and procedures are being removed from the field.
- . Identified 27 instances where design change documents (FCRs/ECNs) were still posted on the drawing after the change had been incorporated on the drawing.

#### NRC Followup

During interviews of the LKC Project Engineer and the Document Control Supervisor, the inspector was informed that to alleviate some of their (LKC) document control problems, drawings are now issued on a need-to-know basis, i.e. a given foreman is only issued the drawing required for his area of responsibility. This includes interface drawings. This has reduced the number of drawing in the field from approximately 40,000 to approximately 22,000.

By procedure, the document control department has 10 days from date of receipt to date of issue to the field. At present, this turn-around-time is averaging 3-5 days.

During a tour of the plant, the inspector selected 30 drawings to check for proper revision and posting of Engineering Change Notices (ECN), FCRs, and NCRs. The drawing revision, ECNs, FCRs, and NCRs,

were compared against the master card file in document control. No discrepancies were identified. During a review of the stick files in the LKC engineering office, it was observed that ECN 7971, dated July 27, 1984, was not posted on drawing 20E-2-3014H01, Revision P. This discrepancy was corrected immediately. These drawings were then checked against the stick files in the CECo office. For drawing 20E-0-3250, CECo had Revision AF and LKC files showed Revision AE as the latest revision. Further review of LKC records indicated that Revision AF had been received on August 16, 1984. During this review, Revision AF was in the process of being posted (3 work days after receipt). The inspector also selected 5 ECNs and 1 FCR that were listed as closed to verify that they had been incorporated into the drawing. No discrepancies were identified in the five ECN's and 1 FCR reviewed.

#### Conclusion

This allegation was substantiated, however, the significant problem had been identified by the licensee and appropriate corrective action taken. The minor issues pointed out by the NRC inspector were promptly addressed and are not indications by any substantive issues.

#### i. Concern

There are cracks in the concrete floors and walls. Water is seeping into the walls.

#### Licensee Action

The problem with water seeping through minute cracks in concrete walls was previously identified and a corrective action program is in place. As new water seepage is identified, the cracks are repaired utilizing approved procedures. This is a normal occurrence at many construction sites. The corrective action is still on-going and appears to be effective.

#### NRC Followup

The inspector reviewed previous inspection reports for the Braidwood Station. This review indicated that this problem had been identified by Region III during a routine inspection on May 14-15, 1980. The findings are documented in Inspection Report No. 456/80-04 and No. 457/80-04. Region III concurred with CECo's proposed corrective action and verified implementation of the program.

While on a tour of the plant during this reporting period, the inspector did not observe any instances where water was seeping through the walls or floors.

#### Conclusion

This allegation was substantiated by personnel interviews and review of previous Region III Inspection Reports. As stated above, the licensee has a program in place to repair the cracks when identified.

j. Concern

There are numerous cases of welders and electricians on drugs and/or alcohol.

Licensee Action

CECo has a program in place that discourages the use of alcohol and drugs. Lunch boxes are randomly checked and the parking lots are checked during the lunch break. If an individual is observed with alcohol or drugs in their possession, on-site or attempting to bring it on-site, his/her employment is terminated at the Braidwood Station. In the case of drugs, the individual and the drugs are turned over to civil authorities.

NRC Followup

During this inspection, the inspector made an unescorted tour of the site. During the tour, the inspector queried craft foremen and general foremen as to the use of drugs and alcohol by personnel they were supervising. In general, the personnel interviewed stated that drugs and alcohol were not a problem at the Braidwood Station. One foreman did state that approximately 3 1/2 years ago he had to fire an individual for the consumption of alcohol on-site. The inspector observed the guard performing lunch box checks and interviewed 5 of these guards (4 day shift and 1 back shift). All of the guards interviewed stated that they had never observed any person with alcohol or drugs. During an interview of the CECo Project Construction Superintendent, the inspector was informed that there was an instance in June 1984 where the guards observed an individual attempting to bring alcohol on-site. This observation was made during a lunch box check. His employment was terminated.

Conclusion

Except for the two instances discussed above, this concern could not be substantiated.

3. Action on Previous Inspection Findings

(Open) Noncompliance (50-456/81-14-02; 50-457/81-14-02): Failure of manufacturer to install required separation barriers between the main control panels 1PM04J and 2PM04J. This item involved separation conflicts between redundant divisions of flow and level indication instruments in the control room. The licensee issued nonconformance reports (NCR's) 323 and 324 to identify systems control panels 1PM04J and 2PM04J as violating separation requirements. The licensee stated that the missing barriers would be installed as soon as the required materials were available. However, installation of the metal dividers for both main control boards has not been completed.

(Closed) Unresolved Item (50-456/82-06-05): It was previously identified that an HVAC duct was observed resting on a safety related tray. This appeared to be in violation of Regulatory Guide (R.G.) 1.29 which requires that structures above safety related equipment be seismically supported.

The licensee inspected the installation of the tray and duct on June 11, 1984. The results of the inspection indicate that the HVAC duct is seismically supported.

(Closed) Open Item (50-456/82-06-07): It was previously identified that a tray installation drawing specified ladder type cable tray instead of solid bottom type. The present revision (Z) of the drawing reflects the change to solid bottom trays.

(Closed) Unresolved Item (50-456/82-06-08): It was previously identified that L. K. Comstock Procedure 4.8.8, "Cable Installation Inspection", did not contain a requirement to verify that cables be installed in accordance with the cable pull card. The latest revision of Procedure 4.8.8, issued on May 12, 1984 now contains routing node verification of the raceway.

In addition, a discrepancy existed between Comstock Procedure 4.3.8 and a Sargent and Lundy (S&L) specification pertaining to cable routing. Comstock Procedure 4.3.8 requires that cables be routed in accordance with the cable pull card and that no deviations are allowed. The S&L specification allows cables to be routed within three feet of a routing marker. This discrepancy has been resolved to allow cables to be routed in accordance with the S&L specifications.

(Closed) Unresolved Item (50-456/83-13-03): It was previously identified that Comstock's cable tray installation Procedure 4.3.8 allowed a redundant cable and raceway to come in contact with each other in apparent violation of IEEE 384. Section 3.2.11.3 of the procedure, states in part, "It is acceptable for the cable in free air to touch the raceway side, bottom or cover as long as it is separated from the cables in the raceway by the solid steel raceway barrier.

Discussion with S&L about this matter indicates that redundant divisions are not routed in close proximity. The routing of redundant divisions is such that two separate cable spreading rooms are utilized, one for each division.

(Closed) Open Item (50-456/83-13-04): It was previously identified that thermal overloads had not been sized correctly and that an instantaneous trip setting had not been set in accordance with its respective data sheet. The licensee's Operational Analysis Department (O.A.D.) has completed a re-verification of all the MCC's which have been turned over to the station. The inspector verified the thermal overload sizes and trip settings in selected MCC's and found no further problems.

(Closed) Unresolved Item (50-456/83-13-05): It was previously identified that internal heaters in motor operated valves (MOV's) were not being energized. The manufacturer's equipment manual recommended energizing the heaters when MOV's were stored in damp areas for extended periods of time. Westinghouse has reviewed this matter and concluded that no adverse degradation of the limit switch compartment would occur if the heaters were not energized.

(Open) Open Item (50-456/84-04-02): It was previously identified that schedules and calibration dates had not been established for panel

gauges. The licensee indicated that a procedure will be written delineating responsibility to calibrate fixed station instruments. The procedure is expected to be written by September 1984.

#### 4. Licensee Action on 10 CFR 50.55(e) Reports

(Open) 10 CFR 50.55(e) (50-456/81-01-EE; 50-457/81-01-EE): Limitorque valve actuators with 300V rated terminal blocks instead of 600 V blocks. The status of this 50.55(e) is uncertain, since it was never formally issued to the region and was retracted on February 18, 1981.

During this time NCR 277 was issued which identified six MOV's which had underrated terminal blocks and internal jumpers with questionable qualifications. S&L responded to the NCR and recommended that the non-conforming terminal blocks and internal jumpers be removed. In addition, S&L suggested that the power cable to the MOV be terminated using a taped lug to lug termination as required for motors. The inspector determined that the electrical power connection to the MOV is of a bolted type. In addition, O.A.D. removes the internal jumpers in the MOV's and replaces them with an SIS qualified cable.

The licensee is in the process of evaluating NCR 277 as a generic problem to all MOV's on site. With regard to 50.55(e) 81-01-EE, no documentation or evaluation to determine whether this item was reportable as a 50.55(e) item has been established.

(Closed) 10 CFR 50.55(e) (50-456/82-03-EE): During testing, voltage sensing relays in the field flashing circuit of the diesel generators were melting after diesel starts. Apparently, these relays did not have adequate DC interrupting rating for their designed use. Corrective Action consisted of removing the speed sensing relays (14FX and 14FRX) and replacing them with heavy duty relays. Additionally, 120 VAC voltage sensing relays were replaced with 125 VDC and a diode rectifier circuit. Records indicated that replacement of the defective components and testing of the circuit had been completed. The inspector verified that the correct type relays were installed in the diesel generator control panel. This item is closed for Unit 1 only.

(Closed) 10 CFR 50.55(e) (50-456/83-10-EE; 50-457/83-10-EE): The licensee reported receiving four power conversion products battery chargers with the wrong type of shunt trip coil on the main input AC breaker. The affected breakers were Square D type KHL, 480V, 3 phase. The breaker shunt trip coils were 120 VAC on a 125 VDC circuit. The input breakers to the battery chargers have been removed and replaced with the proper type. Electrical tests performed by O.A.D. on the breakers indicate that the breaker trip points were within specification limits.

(Open) 10 CFR 50.55(e) (50-456/83-14-EE; 50-457/83-14-EE): Cracked Gould Battery Cells. Cracks were discovered in Gould battery cells 18, 52 and 53. The cause of the cracked cells was unknown at this time but the three cell containers were replaced with new containers. The cause of the cracks was subsequently determined to be the use of a cleaning solvent

(trichloroethylene). The licensee indicated that they would discontinue use of the solvent or any unauthorized cleaning agent on or in the vicinity of any station battery. In addition, procedures and precautions to prevent re-occurrence of this problem have been established. The manufacturer also recommended that existing spacers between cells be replaced with open cell ethofoam spacer. However, replacement of the spacers has not been completed.

5. Licensee Action on IE Circulars

(Closed) Circular (50-456/76-02-cc; 50-457/76-02-cc): Relay failures in Westinghouse BF and BFD relays. Records indicate that (1) Braidwood did not intend to use BF or BFD relays in any safety-related application at the Braidwood Station, (2) procurement specifications did not specify BF or BFD relays, (3) a review of the Westinghouse drawings indicate that no BF or BFD type relays were shown in safety-related system and (4) each vendor of safety-related equipment was notified that BF and BFD type relays were unacceptable for safety-related applications.

6. Review of Comstock Work Activities

- a. During this reporting period, the inspectors attended a training class conducted by representatives of AMP Inc. for the LKC cable terminators. The instructions consisted of a video presentation on termination lugs and an oral presentation on the types of crimping tools that are permitted and not permitted for use by the cable terminators on the Braidwood site. The instructors made up several terminations both acceptable and not acceptable and each attendee was given an opportunity to examine each type. The instructors also demonstrated the proper method and tool for making acceptable "butt-splices" and the attendees examined the butt splice.

Review of Procedures (51061)

- b. The inspectors reviewed LKC Procedures 4.3.8, revision C, dated March 14, 1984, "Cable Installation"; and 4.8.8, revision A, dated March 19, 1984, "Cable Installation Inspection Procedure." The inspectors observed that Procedure 4.8.8 contained Form 37, which is the QC inspection checklist for the cable installation and that the cable pull card is referenced in Procedure 4.3.8.

The inspectors reviewed two other LKC Procedures 4.3.9, revision D, dated June 5, 1984, "Cable Termination Installation"; and 4.8.9, revision E, dated August 14, 1984, "Electrical Termination Inspection" which contained the cable termination checklist.

The inspectors further reviewed Drawings 20-E-30008 "Electrical Installation Cable Information", Sheet 1, revision G, dated October 10, 1983; sheet 2, revision H, dated May 21, 1984, sheet 3, revision H, dated May 21, 1984; sheet 4, revision J, dated April 19, 1984; and Sheet 5, revision G, dated May 21, 1984. No discrepancies were noted.

No items of noncompliance or deviations were identified.

c. Review of Inprocess Cable Installation (51063)

During this inspection, the inspectors observed the inprocess installation of safety-related power cables 1AP073-P1E, 1AP320-P1E, and 1AP322-P1E. It was observed that the LKC QC inspector stopped the cable pull because the train radius of cables 1AP073-P1E and 1AP320-P1E had been violated. The observed radius for 1AP073-P1E was 19" and for 1AP320-P1E was 14 3/4". The minimum train radius for this type cable, 1/C-750 MCM, is 19 1/2" in accordance with S&L Drawing 1-3000B. NCR 644 was prepared to document this discrepancy and "hold tags" were affixed to the subject cables. Verbal approval was given to the licensee by Sargent and Lundy (S&L) and Okonite Company (cable manufacturer) to accept the cable. The cable pull was subsequently completed between panels 1AP05EP and 2AP05E. Except as noted, the cables were installed in accordance with approved procedures. Pending a review of the final disposition and closeout of LKC NCR 644, this item is open (456/84-23-01; 457/84-22-01).

No items of noncompliance or deviations were identified.

d. Review of Cable Installation, Terminations, and Records, (51064, 51066, 52063, 52064, 52065)

During this reporting period, the Region III inspectors traced 7 power, 10 control, and 15 instrument cables to verify proper installation. The inspectors also verified the termination of these cables and reviewed the applicable installation and termination records. Except as noted, all cable installations, terminations, and records were found acceptable.

- (1) Cable Number 1PS085, a 7/c - 14 (seven conductor size 14 AWG) coded as 07146, rated for 600 volts and with segregation code CZE. The cable was pulled between equipment 1JB523A (junction box) and 1PM11J (Containment Isolation Cabinet). The cable appeared to be installed in accordance with pull card 1PS05S, Physical Drawings 1-3312 and 0-3372, and terminated at 1JB523A as indicated on Wiring Diagram 1-4552D and at 1PM11J as indicated on Wiring Diagram 1-4063AE. No discrepancies were noted on the cable pull QC checklist or the cable termination checklists.
- (2) Cable Number 1IA028, a 2/c - 14 (two conductor, size 14 AWG) coded as 02146, rated for 600 volts and with segregation code C2E. The cable was pulled between equipment 1PA32J (Annunciator Input Cabinet-Section B1) and 1SI04E (electrical penetration). The cable appeared to be installed in accordance with Pull Card 1IA028, Physical Drawings 0-3371 and 1-3352, and terminated at 1PA32J as indicated on Wiring Diagram 1-4156G and at 1SI09E as indicated on Wiring Diagram 1-4327D. No discrepancies were noted on the cable pull QC checklist or the cable termination checklists.



- (3) Cable Number 1AF006, a 12/C - 14 (twelve conductor, size 14 AWG) coded as 12146, rated for 600 volts and with segregation code C1E. The cable was pulled between equipment 1AP05EH [4160V, BUS 141] and 1PL04J (Remote Shutdown Panel). The cable appeared to be installed in accordance with Pull Card 1AF006, Physical Drawings 1-3351 and 0-3323, and terminated at 1 AP05EH and indicated on Wiring Diagram 1-4611H and at 1PL04J as indicated on Wiring Diagram 1-4087G. No discrepancies were noted on the cable pull QC checklist or the cable termination checklists.
- (4) Cable Number 1CC131 a 12/C - 14 (twelve conductor, size 14 AWG) coded as 12146, rated for 600 volts and with segregation code C2E. The cable was pulled between equipment 1AP23E (MCC-132x1, 480 V Auxiliary Building ESF) and 1CC-9473B (Unit 1 MOV). The cable appeared to be installed in accordance with Pull Card 1CC131, Physical Drawing 0-3312, and terminated at 1AP23E as indicated on Wiring Diagram 1-4681D and at 1CC-9473B as indicated on wiring diagram 1-4887B. No discrepancies were noted on the cable pull QC checklist or the cable termination checklists.
- (5) Cable Number 1AN090, a 2/C - 10 (two conductor, size 10 AWG) coded as 02106, rated for 600 volts and with segregation code C2E. [Annunciator Input Cabinet - Section B3] and 1AP23E (MCC 132 x 1, 480 V Auxiliary Building ESF). The cable appeared to be installed in accordance with Pull Card 1AN090, Physical Drawings 0-3371 and 0-3312, and terminated at 1PA32J and indicated on Wiring Diagram 1-4156J and at 1AP23E as indicated on Wiring Diagram 1-4681J. No discrepancies were noted on the cable pull QC checklist or the cable termination checklists.
- (6) Cable Number 1AP631, a 2/C - 14 (two conductor, size 14 AWG) coded as 02146, rated for 600 volts and with segregation code C1E. The cable was pulled between equipment 1AP11E (Substation Transformer) and 1AP10EA (480 V. ESF Switchgear 131X, cubicle 1). The cable appeared to be installed in accordance with Pull Card 1AP631, Physical Drawing 1-3351 and terminated at 1AP11E as indicated on Wiring Diagram 1-4630A and at 1AP10EA as indication on Wiring Diagram 1-4630B. No discrepancies were noted on the cable pull QC checklist or the cable termination checklists.
- (7) Cable Number 1DC130, a 9/C - 14 (nine conductor, size 14 AWG) coded as 09146, rated for 500 volts and with segregation code C2E. The cable was pulled between equipment 1PA12J (Safeguards Test Cabinet Train B) and 1DC11J (DC Fuse Panel). The cable appeared to be installed in accordance with Pull Card 1DC130, Physical Drawings 0-3371 and 1-3371, and terminated at 1PA12J as indicated on Wiring Diagram 1-4120C and at 1DC11J as indicated on Wiring Diagram 1-4257C. No discrepancies were noted on the cable pull QC checklist or the cable termination checklists.
- (8) Cable Number 1FW576, a 9/C - 14 (nine conductor, size 14 AWG) coded as 09146, rated for 600 volts and with segregation code C2E. The cable was pulled between equipment 1PM06J (Main Control Board Engineered Safety Features - Section A2) and 1PA28J (Auxiliary Safeguards

Cabinet Train B). The cable appeared to be installed in accordance with Pull Card 1FW576, Physical Drawings O-3372 and O-3371 and terminated at 1PM06J as indicated on wiring diagram 1-4054L and at 1PA28J as indicated on Wiring Diagram 1-4150C. No discrepancies were noted on the cable pull QC Checklist or the cable termination checklists.

- (9) Cable Number 1AP195, a 4/C - 14 (four conductor, size 14 AWG) coded as 04146, rated for 600 volts and with segregation code C1E. The cable was pulled between equipment 1AP05EG (4160 Bus 141) and 1PA31J (Annunciator Input Cabinet - Section A2). The cable appeared to be installed in accordance with Pull Card 1AP195, Physical Drawings 1-3351 and O-3371, and terminated at 1AP05EG as indicated on Wiring Diagram 1-4611G and at 1PA31J as indicated on Wiring Diagram 1-4155B. No discrepancies were noted on the cable pull QC checklist. The termination QC checklist for equipment 1PA31J indicated that the wiring diagrams showed two different conductors as "spares." This issue was resolved by Inspection Correction Report (IRC) No. 1186, which indicated which conductors would be "spares" and the IRC was closed out on April 29, 1982. The termination QC checklist for equipment 1AP05EG indicated that an LKC nonconformance report #529, dated February 17, 1982, was written because non-safety-related cables 1AP255 and 1AP257, both with segregation code C1B, violated the 6" minimum separation criteria inside the cabinet with safety related cable 1AP195. Records indicated that the LKC NCRs 529, 554, 555, 576 and 590 were dispositioned by CECO NCR #390, dated June 22, 1982 and closed out on January 7, 1983. The CECO NCR referenced a Sargent & Lundy letter, dated December 8, 1982, which stated that NCR 390 was reviewed and that it was determined by analysis that the violation of separation requirements did not degrade class 1E circuits below an acceptable level. The letter further stated that this analysis was documented in the Byron/Braidwood Interface Review Reports. No discrepancies were noted.
- (10) Cable Number 1MS318, a 12/C - 14 (twelve conductor, size 14 AWG) coded as 12146, rated for 600 volts and with segregation code C1E. The cable was pulled between equipments 1PA09J (solid state protection system - Train A, Output Cabinets) and 1PM06J (Main Control Board Engineered Safety Features - Section A1). The cable appeared to be installed in accordance with Pull Card 1MS318, Physical Drawings O-3371 and O-3372 and terminated at 1PA09J and indicated on Wiring Diagram 1-4114H and at 1PM06J as indicated on wiring diagram 1-4054E. No discrepancies were noted on the cable pull QC checklist or the cable termination QC checklists.
- (11) Cable Number 1AP414-P1E, 1/C-#1500 MCM, 600 V, routing was verified between ESF substation 1AP11E and ESF switchgear 1AP10EA. The cable was installed, inspected, and accepted on November 6, 1981. The cable was terminated at 1AP11E on December 11, 1981 and at 1AP10EA on December 14, 1981. Crimping tool No. LKC A-806 was utilized to make the terminations. In both cases, the termination was witnessed by an LKC QC inspector. The cable was terminated in

accordance with S&L Drawing 1-4630B, Revision C. No discrepancies were identified.

- (12) Cable Number 10G070-P1E, 3/C-#10, 600 V, routing was verified between ESF MCC 1AP25E and Electrical Penetration 1SI01E. The cable was installed, inspected, and accepted on October 1, 1982. During the walkdown, it was observed that the cable was incorrectly identified (at MCC 1AP25E) as 10G070-C1E. The licensee took immediate action to remove the incorrect label and affix the correct label, i.e. 10G070-P1E. Cable was terminated at 1AP25E on October 7, 1982, de-terminated on September 19, 1983 to change the circuit breakers, and re-terminated on September 19, 1983. The cable was terminated at 1SI01E on January 14, 1983. The termination at the penetration was witnessed by an LKC QC inspector. Cable was terminated in accordance with S&L Drawings 1-4663D, Revision E and 1-4324, Revision H. No discrepancies were identified.

While verifying the routing of cable 10G070-P1E, it was observed that on top of MCC 1AP25E, non-safety-related cable 1CQ013 was in physical contact with safety-related cable 1RC085. This is violation of the requirement that safety-related and non-safety related cables be separated by a minimum of 12" in free air. The licensee provided the inspectors with a copy of Cable Separation Conflict Report 0272, dated August 31, 1984, that documented the identified separation violation.

- (13) Cable Number 1DC040-P2E, 2/C-#2, 600 V, routing was verified between ESF Distribution Panel 1DC06EA and ESF switchgear 1AP06EE. The cable was pulled, inspected, and accepted April 28, 1981. Cable was terminated at 1AP06EE on October 5, 1981 in accordance with S&L drawing 1-4613E, Revision E and at 1DC06EA on October 7, 1981 in accordance with S&L Drawing 1-4251D, Revision E. No discrepancies were identified.
- (14) Cable Number 1DC140-P1E, 2/C-#10, 600 V, routing was verified between ESF Distribution Panel 1DC05EA and 6900 Volt switchgear 1AP03EA. The cable was pulled, inspected, and accepted on October 26, 1981. Cable was terminated at 1DC05EA on October 26, 1981 in accordance with Drawing 1-4250A, Revision F and at 1AP03EA on October 27, 1981 in accordance with Drawing 1-4603A, Revision J. No discrepancies were identified.
- (15) Cable Number 1D0001-P1E, 3/C-#14, 600 V, routing was verified between ESF MCC 1AP21E and transfer pump 1D0001PA. Cable was partially pulled on April 27, 1983 and the pull was completed, inspected, and accepted on April 28, 1983. Cable was terminated at 1AP21E on May 3, 1983 to Drawing 1-4661D, Revision H and at 1D0001PA on July 20, 1983 to Drawing 1-4661D, Revision L. No discrepancies were identified.
- (16) Cable Number 1AF190-P2E, 3/C-#10, 600 V, routing was verified between ESF MCC 1AP23E and equipment 1AF01PB-C. The cable was pulled, inspected, and accepted on January 26, 1984. Cable was terminated at 1AP23E on January 31, 1984 to Drawing 1-4681A,

Revision E and at 1AF01PB-B on March 29, 1984 to Drawing 1-4469G, Revision D. It was observed that the cable pull card indicates that the cable terminated at Unit C while the termination card indicates that the cable terminates at Unit B. A review of the CIS-4 report (controlling document) indicates that the cable pull card is in error. A pen and ink change has been made on the pull card by the licensee to show cable termination at Unit B. No other discrepancies were identified.

- (17) Cable Number 1VP048-P1E, 3/C-500 MCM, 600 V, routing was verified between electrical penetration 1VP03E and RCFC Fan 1VP01CC. The cable was pulled, inspected, and accepted on September 7, 1983. Cable was terminated at 1VP01CC on September 30, 1983 and at 1VP03E on October 4, 1983 to Drawing 1-4333, Revision B. The terminations at both units were witnessed by LKC QC. No discrepancies were identified.
- (18) Cable Number ICC291-K3R, 1TW-PR #16 (shld), 600 V, routing was verified between electrical penetration 1SI07E and local instrument panel 1PL70J. The cable was pulled, inspected, and accepted on November 25, 1983 to pull card Revision A. Cable was terminated at 1SI07E on December 1, 1983 to Drawing 1-4330A, Revision F, and at 1PL70J (Instrument 1FIS-0657) on December 5, 1983 to drawing 1-4105P, Revision G. The terminations at both units were witnessed and accepted by LKC QC. Further research indicated that this cable should be terminated at instrument 1FT-0657 on panel 1PL70J in accordance with Drawings 1-4105P, Revision H, and 1-4109N, Revision H, dated August 9, 1984. It was also observed that Revision B to the cable pull card indicates that the cable should terminate at instrument 1FT-0657, although, as of August 31, 1984, no work had been performed to this revision of the pull card.

Subsequent to the inspection, the licensee provided the following information to Region III via a telephone conversation between Mr. L. Tapella, CECO, and Mr. R. Love, Region III.

As a result of the licensee's commitment to Branch Technical Position No. ASB-4, Westinghouse Electric Company (W) notified S&L of the pending change of instrument 1FIS-0657 to instrument 1FT-0657, in a letter dated March 22, 1983. On May 10, 1983, a Drawing Revision Notification (DRN) was issued for P&ID 1287. On July 12, 1983, W issued Field Change Notice (FCN) No. CCEM-10612 to change the subject instrument from 1FIS-0657 to 1FT-0657. Phillips, Getchow Company (PGCo) ordered and received instrument 1FT-0657. During receipt inspection, February 1984, PGCo placed the subject instrument on hold pending receipt of the required documentation. As of September 4, 1984, this instrument was still on hold. On August 22, 1984, PGCo issued a Field Change Order (FCO) to remove instrument 1FIS-0657 and install instrument 1FT-0657. When PGCo is ready to implement the subject FCO, they will initiate a request to LKC for the de-termination of cable ICC291-K3R at instrument 1FIS-657. Upon completion of the change-out of the subject instruments, LKC will

be notified so that they can re-terminate the cable to instrument IFT-0657 in accordance with approved drawings. Pending a review of the implementation, including re-termination, of the FCO, this item is open (456/84-23-02).

- (19) Cable Number 1NR085-K3N, 2TW-PR #16 (shld), 600 V, routing was verified between instrument panel 1PM07J and electrical penetration 1SI07E. The cable was pulled, inspected, and accepted on January 13, 1983. Cable was terminated at 1SI07E on January 17, 1983 to Drawing 1-4330, Revision F and at 1PM07J on January 19, 1983 to Drawing 1-4056K, Revision C. No discrepancies were identified.
- (20) Cable Number 1DG026-K1E, 3TW-SH #16 (shld), 600 V, routing was verified between DG1A control panel 1PL07J and junction box 1DG01KA-H. The cable was installed, inspected, and accepted on March 29, 1983. Cable was terminated at 1PL07J on April 4, 1983 to Drawing 1-4093C, Revision E and at 1DG01KA-H on April 5, 1983 to Drawing 1-4094C, Revision E. No discrepancies were identified.
- (21) Cable Number 1DG029-K1E, 3TW-SH #16 (shld), 600 V, routing was verified between DG1A control panel 1PL07J and junction box 1DG01KA-G. The cable was installed, inspected, and accepted on March 14, 1983. Cable was terminated at 1PL07J on March 18, 1983 to Drawing 1-4093C, Revision E and at 1DG01KA-G on March 18, 1983 to Drawing 1-4094C, Revision E. No discrepancies were identified.
- (22) Cable Number 1DG046-K2E, 3TW-SH #16 (Shld), 600 V, routing was verified between DG1B control panel 1PL08J and junction box 1DG01KB-S. The cable was installed, inspected, and accepted on March 2, 1983. Cable was terminated at 1PL08J on March 10, 1983 to Drawing 1-4098C, Revision E and at 1DG01KB-S on June 21, 1983 to Drawing 1-4100A, Revision D. No discrepancies were identified.
- (23) Cable Number 1DG047-K2E, 3TW-SH #16 (Shld), 600 V, routing was verified between DG1B control panel 1 P108J and junction box 1DG01KB-S. The cable was installed, inspected, and accepted on March 2, 1983. Cable was terminated at 1PL08J on March 10, 1983 to Drawing 1-4098C, Revision E, and at 1DG01KB-S on June 21, 1983 to Drawing 1-4100, Revision D. No discrepancies were identified.
- (24) Cable Number 1DG048-K2E, 3TW-SH #16 (Shld), 600 V, routing was verified between 1DG1B control panel 1PL08J and junction box 1DG01KB-S. The cable was installed, inspected, and accepted on March 2, 1983. Cable was terminated at 1PL08J on March 10, 1983 to Drawing 1-4098C, Revision E and at 1DG01KB-S on June 21, 1983 to Drawing 1-4100A, Revision D. No discrepancies were identified.

(25) Cable Number 1DG101-K2E, 3TW-SH #16 (Shld), 600 V, routing was verified between DG1B control panel 1PL08J and junction box 1DG01KB-Q. The cable was originally pulled on May 25, 1983, however, it was too short. Cable was removed on May 31, 1983 and scrapped. The replacement cable was installed, inspected, and accepted on May 31, 1983. Cable was terminated at 1PL08J on June 2, 1983 to Drawing 1-4098C, Revision E and at 1DG01KB-Q on June 3, 1983 to Drawing 1-4099A, Revision B. No discrepancies were identified.

(26) Cable Number 1RC376-K2R, 1TW-PR #16 (Shld), 600 V, routing was verified between electrical penetration 1SI06E and Loop 1A flow transmitter 1FT-0415. The cable was originally installed, inspected, and accepted on November 17, 1982. On January 10, 1983, the cable was pulled back and coiled at junction box 1JB051R-K2R. On March 23, 1983, the cable was re-installed in conduit CIR 5162-K2R and final accepted. Cable was terminated at 1FT-0415 on March 19, 1983 to Drawing 1-4109C, Revision G and at 1SI06E on March 25, 1983 to Drawing 1-4329A, Revision E. The termination of the cable at 1SI06E was witnessed by an LKC QC inspector. No discrepancies were identified.

(27) Cable Number 1RC359-K1R, 1TW-PR #16 (shld), 600 V, routing was verified between electrical penetration 1SI05E and local instrument panel 1PL66J. The cable was partially pulled on January 13, 1983. Cable was coiled at junction box 1JB335R-K1R (to end). On March 17, 1983, the cable pull was completed, inspected, and accepted. On March 26, 1983, the cable was pulled out of conduit CIR 1303-K1R and coiled at 1JB334R-K1R.

On April 14, 1983, the cable was re-installed, inspected, and accepted. Cable was terminated at 1SI05E (QC witnessed) on January 28, 1983 to Drawing 1-4328A, Revision E and at 1PL66J on April 15, 1983 to Drawing 1-4105M, Revision D. During a review of the terminations in junction box 1JB428R-K1R, it appeared that the copper conductor was not inserted far enough into the lug barrel to provide a good mechanical and electrical connection on three terminations. Also, it appeared that the copper conductor extended too far beyond the lug barrel on one termination so as to cause interference when installing the termination screw. The licensee was requested to re-inspect these terminations and determine their acceptability. Pending a review of the reinspection of these 4 terminations for acceptability, this item is open (456/84-23-03).

(28) Cable Number 1FW051-K3R, 1TW-PR #16 (Shld), 600 V, routing was verified between S/G1A level transmitter 1LT-0518 and electrical penetration 1SI07E. The cable was installed, inspected, and accepted on December 6, 1982. Cable was terminated at 1LT-0518 on December 16, 1982 to Drawing 1-4109C, Revision D and at 1SI07E on January 10, 1983 (QC witnessed) to Drawing 1-4330A, Revision D. During the inspection of terminations at 1SI07E, LKC QC identified that the outer heat shrink jacket was not properly applied (procedure violation). This discrepancy was documented on

Inspection Correction Report (ICR) 2113. This ICR was properly closed on May 6, 1983. No discrepancies were identified.

- (29) Cable Number 1FW053-K3R, 1TW-PR #16 (Shld), 600 V, routing was verified between S/G 1B level transmitter 1LT-0528 and electrical penetration 1SI07E. The cable was partially pulled on December 6, 1982. Cable was coiled at junction box 1JB282R-K3R. On December 17, 1983, the cable pull was completed, inspected, and accepted. Cable was terminated at 1LT-0528 on December 17, 1983 to Drawing 1-4109C, Revision D and at 1SI07E on January 10, 1983 (QC witnessed) to Drawing 1-4330A, Revision D. ICR 2113 was prepared to document discrepancies (Ref. paragraph (28) above). No discrepancies were identified with cable installation, terminations, and applicable records.

While verifying the routing of cables 1FW053-K3R and 1FW055-K3R through conduit CIR-4104-K3R, it was observed that the conduit was not attached to the last 2 hangers adjacent to electrical penetration 1SI07E. The inspectors were provided a copy of LKC's raceway rework form for the subject conduit. The conduit was adequately supported so as not to damage the cables during rework of the conduit hangers. No discrepancies were identified.

- (30) Cable Number 1FW055-K3R, 1TW-PR #16 (Shld), 600 V, routing was verified between S/G 1C level transmitter 1LT-0538 and electrical penetration 1SI07E. The cable was installed, inspected, and accepted on December 6, 1982. Cable was terminated at 1LT-0538 on December 17, 1982 to Drawing 1-4109C, Revision D and at 1SI07E on January 10, 1983 to Drawing 1-4330A, Revision D (QC witnessed all terminations). ICR 2113 was prepared to document discrepancies (Ref. paragraph (28) above). No discrepancies were identified.
- (31) Cable Number 1FW059-K4R, 1TW-PR #16 (Shld), 600 V, routing was verified between local instrument panel 1PL69J and electrical penetration 1SI08E. The cable was installed, inspected, and accepted on February 28, 1983. Cable was terminated at 1PL69J on April 15, 1983 to Drawing 1-4105M, Revision D and at 1SI08E on April 6, 1983 to Drawing 1-4331A, Revision D. No discrepancies were identified.
- (32) Cable Number 1RC226-K1R, 1TW-PR #16 (Shld), 600 V, routing was verified between electrical penetration 1SI05E and local instrument panel 1PL66J. Cable was partially pulled on January 13, 1983. Cable was coiled at junction box 1JB334R-K1R. On March 17, 1983, the cable pull was completed, inspected, and accepted. On March 26, 1983 the cable was pulled out of conduit CIR 1303-K1R and coiled at 1JB334R-K1R. On April 14, 1983, the cable was re-pulled into conduit CIR1303-K1R, inspected, and accepted. Cable was terminated at 1SI05E on January 28, 1983 to Drawing 1-4328A, Revision E and at 1PL66J on April 15, 1983 to Drawing 1-4105M, Revision D. No discrepancies were identified.

No items of noncompliance or deviations were identified.

e. Review of Nonconformance Reports (51066)

During a review of nonconformance reports (NCR) and interview of LKC engineering personnel who provided the recommended dispositions to NCRs, it appeared that there was some confusion as to the proper usage of the term "reject". If the engineer determined that the NCR was not valid, they would mark the "reject" block in the recommended disposition rather than voiding the NCR. A contributing factor to this confusion is that the terms reject, repair, rework, etc. are not defined in the LKC nonconformance report procedure. The inspectors were informed that the nonconformance report procedure had been revised and forwarded to CECO for approval. During a review of this unapproved procedure, it was observed that the term reject had been removed from the procedure and the other terms were defined. It should be noted that LKC only provides a recommended disposition on NCRs. The NCRs are dispositioned by the licensee and when applicable, by the engineer, Sargent and Lundy. Pending a review of the revised procedure, as approved, and training records for the applicable personnel, this item is open (456/84-23-04; 457/84-22-02).

No items of noncompliance or deviations were identified.

f. Review of Inspection/NCR/ICR Backlog

During previous inspection, Region III expressed a concern about the number of open NCRs and ICRs and the apparent lack of effort in the dispositioning/reworking/repairing, etc. of these nonconforming items. As a result of CECO and Region III concerns, LKC Quality Control (QC) has increased their staff to approximately 83 personnel. LKC Quality Assurance (QA) has increased from 1 to 3 QA engineers. LKC engineering has recently employed a new project engineer and 5 field engineers. The inspectors were informed that as of August 31, 1984, approximately 70% of the construction effort is being expended in rework/repair activities. Weekly meetings, CECO and LKC, are conducted to discuss the open NCRs/ICRs and methods to reduce the backlog. Most of the new NCRs/ICRs are being prepared on "old work" (inspection backlog). Following is the status of open NCRs/ICRs:

<u>Date</u>	<u>Total</u>	<u>New This Week</u>	<u>Closed since Last Week</u>	<u>Open 0-29 Days</u>	<u>Open 30-59 Days</u>	<u>Open 60-119 Days</u>	<u>Open Over 120Days</u>
8/16/84	1449 NCRs 1621 ICRs	50 95	27 60	223 339	263 325	438 355	525 602
8/23/84	1484 NCRs 1616 ICRs	49 24	9 23	204 299	247 355	494 329	539 633
8/30/84	1515 NCRs 1717 ICRs	16 82	8 6	175 336	212 330	515 404	613 647

Following is the location status, from the WANG, as of August 22, 1984:



<u>Location</u>	<u>NRCs</u>	<u>ICRs</u>
LKC Engineering	254	592
CECo/S&L	807	-
LKC Construction	131	391
LKC QC	162	426
QC Hold	24	119
Construction Hold	-	22
Approximate Number to be entered	106	66

Following is the inspection backlog as of August 10, 1984:

Welding/Configuration	945
Junction Box/Small Equipment	*108
Cable Pan Node Release	624
Cable Tray	99

\*153 returned to engineering for review.

#### 7. Review of Phillip, Getschow Work Activities

- a. During its reporting period, the inspectors reviewed the last three CECo QA audits of PGCo in the area of installation of instrument piping (sensing lines) and instrumentation. The piping and instrumentation is installed in accordance with the ASME Boiler and Pressure Vessel Code (Sections II, III, V, and IX), ANSI B31.1 "Power Piping", Specifications F/L 2739, and the applicable S&L Drawings. Following is a brief summary of the audits reviewed:

- (1) Audit No. QA-20-84-535, conducted July 17-19, 1984. Areas audits were: ASME Code Inspection, Calibration Control, Test and Inspection Control, Welding and Weld Rod Control, and Concrete Expansion Anchor (CEA) Installation.

Finding #1: Certification of Level I and Level II OC personnel was given prior to documented evidence of completion of required hours of classroom training. (Certification for 19 inspectors was revoked.)

Observation #1: CEA installation travelers indicated that all work was completed, however, unused bolt holes were not grouted.

Observation #2: Late and inadequate response to CECo QA surveillance 3552. "No instructions in QAP-7 for the verification/calibration of portable and stationary weld rod ovens, and precision levels."

Open Item #1: Internal plate spacing is not being checked for instrument panel installation, being made for hangers only. Clarification on necessity and responsibility for checking is required.

Open Item #2: Visual inspection of 100% of tack welds which are consumed in the finished weld is not being done, except on large bore pipe. Item is open pending resolution of this item at Byron Station.

Of particular interest to this inspector was Question No. 15 of the audit plan, which states, "Verify that Test and Inspection Records contain the following information at a minimum:

- (a) System/Item tested or inspected
- (b) Date of Test
- (c) Test equipment ID number
- (d) Type of test/inspection
- (e) Results/acceptability
- (f) NCRs/dispositions
- (g) Procedure Number/Revision
- (h) Personnel performing/witnessing test/inspection
- (i) ANI sign-off where applicable
- (j) Pressure and holding times (for pressure tests)

All items for Question No. 15 were found to be satisfactory by the audit team.

- (2) Audit No. QA-20-84-518, conducted April 17-27, 1984 in PGCo's Joliet Office and on-site. Areas audited were:

- (a) Pipe bends - satisfactory
- (b) Pipe/support layout - two cases utilizing incorrect design data and eight cases of improperly rated design loading were identified with two supports being under designed. Design information being transmitted between S&L and PGCo via a Field Problem Report. This impacts design control and may affect installations.
- (c) QC inspection/verification - Finding #1 - Errors in chain dimensions, heat numbers, pitch, serial numbers and bend angularity. Also see finding #2.
- (d) Support installation - Finding #3.

Finding #1: QC personnel are not adequately verifying dimensions, slope and heat numbers from small bore pipe and instrument field installations.

Finding #2: QC personnel responsible for reviewing data packages did not have the required training or supportive documentation in their files.

Finding #3: Unacceptable instrument support installations were inspected and accepted by QC.

(3) Audit No. QA-20-83-62, conducted December 6-13, 1983.

Finding #1: QC inspector requalification program samples were not selected in strict accordance with CECO instructions in that every 5th inspector was not selected.

Finding #2: As-built piping configurations have not been checked against installation documents to assure acceptability, i.e. program not timely to verify that the as-built conditons meet the design intent (hanger spacing/loading/etc.). This was previously identified by QA surveillance 3172, dated October 31, 1983.

Finding #3: Rework was performed on a small bore pipe support without proper authorizing documentation.

Finding #4: Whip restraint dimensions were incorrectly transferred from design documents to the PGC0 installation drawings (two dimensions were found to be incorrect on PGC0 drawings).

Finding #5: Fit-up gap and filler metal identification inspections were not documented on two whip restraint travelers.

Observations #1: The weld rod ticket for a consumable insert incorrectly identified the size of the insert issued.

Observation #2: Welder identification number and weld filler material heat numbers were not recorded on a socket weld traveler.

Observation #3: Discrepancy existed between the QC recorded whip restraint dimension (2'2½") and the actual dimensions (2'0") observed.

For the audit items that have been closed by CECO, the corrective action appeared to be adequate. No items of noncompliance or deviations were identified.

b. During this reporting period, the inspectors reviewed the following PGC0 procedures and found them to be adequate:

- (1) Procedure PGCP-30, Revision 7, dated January 10, 1984, "Installation of ASME Section III and Safety-Related Instruments and Instrument Lines." During a review of this procedure, it was observed that the requirements to verify sensing line slope, separation between redundant sensing lines, separation between sensing lines and process piping, heat numbers, etc. were incorporated in this procedure. ECN 7605 was also incorporated and now defines Snug Tight, Wrench Tight and Hand Tight.

- (2) Procedure QCP-B32, Revision 2, dated June 28, 1984, "Instrumentation Retrofit Verification (IRV) Program." This procedure was developed to do a reinspection of instrumentation installations that were completed prior to February 1984.
- (3) Procedure PGCP-11, Revision 10, dated February 8, 1984, "Bending of Small Bore Safety-Related Pipe."

No items of noncompliance or deviations were identified.

- c. During this reporting period, the inspectors selected four completed instrument sensing line for walk down. The actual installation was compared to the applicable PGCo drawing. It should be noted that the Phase I inspection program to PGCo Procedure QCP-B32 (Ref. paragraph 7.b.(2)) is in progress. Phase I is an inspection/rework/repair by PGCo construction/engineering. The Phase II inspection will be performed by PGCo QC inspectors.

- (1) Instrument 1FT-444, Reactor Coolant Loop D flow:

- . Drawing 1FT-444, Sheet 1, Revision A, Class H (ANSI B31.1) flow transmitter (FT) is mounted on Instrument Panel 1PL50J which is located inside Containment at approximately R-12 line, elevation 377'. An arc strike approximately 4" long was observed on the high pressure line, located approximately 12" above the panel. A review of QC records by PGCo indicted that this arc strike had not been identified and documented by a PGCo QC inspector. Observed this system being reinspected per procedure QCP-B32.
- . Drawing 1FT-444, Sheet 2, Revision A, Class B (ASME, Section III, Subsection NC). Loop D located at approximately R-10 line, 377' elevation with the sensing line tap at the 365' 10" elevation. Observed an apparent redundant sensing line violation in that there was an 8" separation (18" required) between sensing lines for instruments 1FT-444 and 1FT-455 in the area of R-10 and R-11 lines. As stated in the above paragraph, reinspection was in progress and separation is an inspection attribute per procedure QCP-B32.

- (2) Instrument 1FT-445, Reactor Coolant Loop D flow, is a locally mounted instrument located at the R-16 lines, 377' elevation.

- . Drawing 1FT-445, Sheet 1, Revision A, Class H.
- . Drawing 1FT-445, Sheet 2, Revision A, Class H. There is a pipe class change at the shield wall penetration.
- . Drawing 1FT-445, Sheet 3, Revision A, Class B. It appears that there is a negative slope to this instrument line in the area of the R-15 line, 382' elevation.

- . Drawing 1FT-445, Sheet 4, Revision A, Class B. See paragraph (1) above on apparent separation violation of sensing lines.
- (3) Instrument 1FT-446, Reactor Coolant Loop D flow, located on instrument panel 1PL52J. The panel is located at the R-7 line, 377' elevation.
- . Drawing 1FT-446, Sheet 1, Revision A, Class H.
  - . Drawing 1FT-446, Sheet 2, Revision A, Class B.
- (4) Instrument 1PT-467A, Pressurizer pressure, located on a local rack at the R-8 line, 412' elevation. The sensing line for this instrument also provides the pressure signal for pressurizer level transmitter 1LT-459 and pressure transmitter 1PT455. These two instruments are located on instrument panel 1PL50J, R-12 line, 377' elevation. The following drawings were utilized in walking down this system:

1PT-467A, Sheet 1, Revision 0  
 1PT-467A, Sheet 3, Revision D  
 1LT-459, Sheet 2H, Revision 0  
 1RC-93D, Sheet 2, Revision 0  
 PG2542C-129, Revision B  
 S&L Drawing M-2060, Revision R  
 1PT-467A, Sheet 2, Revision 0  
 1LT-459, Sheet 1, Revision C  
 1RC-93D, Sheet 1, Revision 0  
 1PT-455, Sheet 1, Revision 0  
 PG2542C-128, Revision B

During a review of drawing 1PT-467A, Sheet 2, Note 6, which states, "Single pipe pressure instruments are recommended to have their sensing lines installed with a continuous slope (1/2" per foot recommended), however, it is acceptable to have horizontal runs without slope and a high point without high point vent valves provided no traps are formed." The wisdom of this note was discussed with the CECO Instrument Engineer, PGCo Instrumentation Engineering Group Supervisor, PGCo Lead Field Engineer and the PGCo Instrumentation Area Superintendent. During the exit interview on August 31, 1984, the inspectors were informed that steps were being taken to remove this type of note from all drawings where the sensing line is utilized to provide a signal to a flow or level transmitter. This item will be followed as part of the IE Module Inspection Program.

No items of noncompliance or deviations were identified.

- d. During the walkdown of instrument sensing lines described in Paragraph c. above, the inspectors noted the heat/code/serial number from various items to verify that the applicable documentation was on file and acceptable. The inspector also noted 3 welder's symbol numbers to verify that they had been certified. Following are the results of this review.

- (1) Weld filler metal, ER308, 3/32" x 36", Heat No. C3058, Lot No. 25929, Specifications - AWS A5.9-77 with Winter 1979 Addenda. This specification is identical to ASME Code, Section II-C, SFA5.9. Reviewed the chemical certification and compared it against the requirements. No discrepancies were identified.
- (2) 1/2" pipe, Schedule 160 Heat No. 09801, Specifications - ASME Code Section II, SA312-TP304 (Class 2), 1974 Edition with Summer 1975 Addenda. Reviewed the chemical and physical certifications and the Certificate of Compliance. No discrepancies were identified.
- (3) 1/2" - 90° elbow, Heat No. Code UJ. A review of the cross-index indicates that Heat No. 02358 is applicable for code UJ on this type of fitting. Reviewed the chemical and physical certifications. No discrepancies were identified.
- (4) 1/2" valves, Serial No. 12133 and No. 12352. Reviewed the ASME Code Date Report Forms, NPV-1, for these two valves. The Authorized Nuclear Inspector (ANI) signed these forms on May 22, 1981. During the walkdown, it was observed that an ASME name plate was attached to each valve and each name plate was stamped with an ASME NV Symbol.
- (5) Reviewed the certification documentation packages for Welder Q7, 707, and 869. Observed that the qualification test reports for each procedure were available. Reviewed the PGCo log that indicates each of the above welders had maintained their certification by utilizing the applicable process at least once every three months. No discrepancies were identified.
- (6) During a review of the inspection and test records for the installation of the sensing lines for the instruments discussed in paragraph 7.c above, it was observed that PGCo QC had not performed the final review and approval, of the records reviewed, as of August 28, 1984. The following examples are provided:

- . 1FT-445, Sheet 2, To QC September, 1981
- . 1FT-445, Sheet 3, To QC August 17, 1983
- . 1FT-445, Sheet 4, To QC September 30, 1983. also, Field Change Orders (FCO) IRC-13 and IRC-95 were not signed off as being completed (documentation package in QC vault).
- . 1FT-446, Sheet 1, To QC March 21, 1983
- . 1FT-446, Sheet 2, To QC August 15, 1983. Also, FCOs IRC-31 and IRC-96 not signed off as complete.

This lack of final review and approval was not identified by CECo QA (Reference: Paragraph 7.a.(1) above).

In that there is a major reinspection of the instrumentation

system in progress, and that the scheduled completion date is January 1, 1985, the licensee was informed that this item would be considered as unresolved pending a review of the reinspection effort and applicable records (456/84-23-03; 457/84-22-03).

No items of noncompliance or deviations were identified.

e. Inspection Report No. 456/83-10 and No. 457/83-10

During the inspection of Braidwood Station on June 20 thru July 1, 1983 (Report No. 456/83-10; 457/83-10) there were two items that were characterized in the report details as items of noncompliance and assigned tracking numbers (456/83-09-xx; 457/83-09-xx). These items were inadvertently left out of the 83-09 report and associated appendix. These items have been downgraded to unresolved items. For tracking purposes, they have been assigned an 83-10 number as follows:

- (1) During a review of PGC's procedures, it was observed that these procedures do not require the verifications and recording of the heat numbers/code number/serial number of items installed. It is the inspectors understanding that the procedure will be revised to insert this requirement. Pending a review of the revised procedures, this item is unresolved (456/83-10-04; 457/83-10-04).
- (2) During a review of inspection records for level transmitter (1LT-459 and 1LT-460) sensing lines, it was observed that PGC's QC performs 100% inspection on all pipe bends. It was also observed that QC was not documenting the calibrated instrument number or calibration due date on the bend inspection checklist. It appears that the calibrated instrument utilized to perform an inspection is not traceable to the inspection. Pending the verification of calibrated instrument control and traceability to its use, this item is unresolved (456/83-10-05; 457/83-10-05).
- (3) During the review of material receiving reports (MRR) the inspector could not find any indications that: (1) heat numbers were being verified; (2) minimum wall thickness was being verified; and (3) calibrated tools/instruments were utilized in performing receipt inspections. Pending a more detailed review of receipt inspection practices, this item is unresolved (456/83-10-06; 457/83-10-06).

8. 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 7.d.(6), and 7.e.(2), and 7.e.(3).

9. Open Items

Open items are matters which have been discussed with the licensee, which

will be reviewed further by the inspectors, 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 6.c., 6.d.(18), 6.d.(27) and 6.e.

10. Exit Interview

The Region III inspectors met with the licensee representatives (denoted under Paragraph 1) at the conclusion of the inspection on August 31, 1984. The inspectors summarized the purpose and findings of the inspection. The licensee acknowledged this information.