



Commonwealth Edison

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April 28, 1988

Mr. A. Bert Davis
Regional Administrator
U. S. Nuclear Regulatory Commission
Region III
799 Roosevelt Road
Glen Ellyn, IL 60137

SUBJECT: Braidwood Station Units 1 and 2
Response to Inspection Reports Nos.
50-456/87-038 and 50-457/87-036
NRC Docket Nos. 50-456 and 50-457

REFERENCE: (a) H. J. Miller letter to C. Reed dated March 18, 1988

Dear Mr. Davis:

This letter is in response to the inspection conducted by Messrs. Z. Falevits and R. Landsman on October 5 through 22, 1987, January 19, February 18 and 26, 1988 of activities at Braidwood Station. Reference (a) indicated that certain activities appeared to be in violation of NRC requirements. The Commonwealth Edison Company response to the Notice of Violation is provided in the enclosure.

If you have any further questions on this matter, please direct them to this office.

Very truly yours,

H. E. Bliss
Nuclear Licensing Manager

Encl.

cc: NRC Resident Inspector - Braidwood
NRC Document Control Desk

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ENCLOSURE

COMMONWEALTH EDISON COMPANY
RESPONSE TO INSPECTION REPORTS 456/87-038 AND 457/87-036

VIOLATION: (456/87038-02A, 457/87036-02A, 457/87036-02B AND 457/87036-02C)

10 CFR 50, Appendix B, Criterion V, as implemented by Commonwealth Edison Company (CECo) Quality Assurance Manual, Nuclear Generating Stations, Section 5, requires that activities affecting quality be accomplished in accordance with documented instructions, procedures, and drawings of a type appropriate to the circumstances.

Contrary to the above, the following examples of failure to follow procedures or inadequate procedures were identified.

- a. Electrical Lineup Operating Procedures BWOP OG-E1 and E2 and Mechanical Lineup Procedures BWOP OG-M1 and M2 failed to include certain valves and other components required to correctly line up the electrical and mechanical components of the Hydrogen Recombiner System. (456/87038-02A and 457/87036-02A)
- b. Nine termination cards for cables in the Reactor Coolant (RC) system had been signed and dated even though the cables were still unplugged. This is contrary to the latest design drawings and to cable termination procedure WI-4.3.9 which required that termination cards be signed and dated whenever a termination is completed. (457/87036-02B)
- c. L.K.C. Q.C. Inspection Checklist of Electrical Termination for cable 2VA720, dated November 16, 1987, contained the wrong drawing number and revision for the drawing referenced for this activity. Also, the termination points noted in the remarks column were points in the Unit 1 panel rather than the Unit 2 panel. Furthermore, the cable determination card for the same cable, dated November 11, 1987, referenced a wiring diagram that did not exist. This is contrary to the requirement of Braidwood Form No. 36, "QC Inspection Checklist Instructions of Electrical Terminations," Procedure 4.8.9, Revision G. (457/87036-02C)

RESPONSE: (456/87038-02A and 457/87036-02A)

Commonwealth Edison acknowledges that technically, both areas identified by the Inspector are correct. This example of violation consists of basically two parts. The first is that the four lineups do not include the opposite train recombiner suction and discharge valves. The second part is that several other valves and components in addition to the above are missing from BWOP OG-M2.

The first part, opposite train suction and discharge valves not included in the lineups, was addressed by the Onsite Review Committee when the procedures were being developed. The lineups for the procedures are unique in that they address the train A recombiner valves and components in the M1 and E1 lineups and train B in the M2 and E2 lineups. The procedure for startup of the recombiners, BWOP OG-10, requires the applicable mechanical and electrical lineups for the recombiner(s) to be accomplished.

The second part, BWOP OG-M2 not including the train B recombiner valves and components, was previously identified and corrective action was in progress at the time of the inspection. The train B line up procedure had lagged behind train A but was completed 10/09/87.

The safety significance of this item is minimal as the recombiners are a manually operated system and are not required to be placed in service until approximately 4 days into an accident. A loss of an electrical division can either be restored or the valves can be operated locally as shielding is provided.

CORRECTIVE ACTION TAKEN AND RESULTS ACHIEVED:

BWOP OG-M2 was revised and implemented 10/09/87, addressing the missing valves and components that needed to be incorporated (with exception of the opposite train recombiner suction and discharge valves).

All four lineups were performed specifically for the recombiners on 10/11/87 to assure correct lineup of both trains.

Incorporation of opposite train recombiner suction and discharge valves into the lineups had not been addressed during the inspection. At present all four lineups do not include the opposite train recombiner suction and discharge valves. However, this is addressed as stated below.

CORRECTIVE ACTION TAKEN TO AVOID FURTHER VIOLATION:

Future revisions to procedures that include movement of procedure blocks or technical changes that significantly affect both units and/or both trains will be revised concurrently where practical to prevent one unit and/or train from lagging behind the other beyond the point where it is actually required for operation.

To preclude the confusion identified by the Inspector that may result from having the train A components in the M1 and E1 Lineups and the train B components in the M2 and E2 lineups, the procedures will be concurrently revised to divide the OG system lineups into the following groups:

BWOP OG-M1 and E1 will include all U1 Secondary side OG components.

BWOP OG-M2 and E2 will include all U2 Secondary side OG components.

BWOP OG-M3 and E3 will include all U1 Primary side OG components (including both trains of recombiners and the cross-tie valves).

BWOP OG-M4 and E4 will include all U2 Primary side OG components (including both trains of recombiners and the cross-tie valves).

BWOP OG-10 will be revised to reflect the above changes.

DATE OF FULL COMPLIANCE:

The OG block revisions are expected to be completed by July 15, 1988.

RESPONSE: (457/87036-02B)

Commonwealth Edison does not believe that this is an example of the cited violation. The terminations referred to in this case are wires soldered to pins in a connector which eventually is plugged into the reactor head plate on the integrated head package.

The termination cards addressed in the report are a production document not a Quality Control (QC) document and, as such, do not determine the acceptability of the installation. The QC inspection checklists were complete and accurately reflected the status of the installation (ie. cable was soldered to the pin, but not plugged in).

The connectors were plugged into and unplugged from the head plate several times to support preoperational testing. They were first plugged in and tested prior to integrated hot functional testing which began July 1, 1987. They had been designed to be unplugged and plugged in every time the reactor head is removed or replaced. In November 1987, at the time of the NRC inspection, the reactor head was temporarily set in place to protect the reactor vessel while preparations were being made for fuel loading. As such, the head cables were not plugged in at that time.

When the reactor head was replaced after fuel loading, the connector installation was performed by the Electrical Maintenance Department in accordance with procedure BWHP 4002-021, Rev. 0, (Determ/Reterm Electrical Checkout of Reactor Head) and was complete at that time.

RESPONSE: (456/87036-02C)

Commonwealth Edison acknowledges that the L.K. Comstock Quality Control (QC) Inspection Checklist of Electrical Termination for cable 2VA720 contained some discrepancies. Cable 2VA720 was one of 10 cables abandon/spared in Unit 2 by Approval of Design for Installation (ADI) 7559. The same cables were abandon/spared in Unit 1 by ADI 7758. L.K. Comstock craft personnel determined cable 2VA720 on 11/11/87. On 11/16/87, the L.K. Comstock inspector field verified the abandonment of cable 2VA720.

The wiring diagram referenced in the L.K. Comstock QC checklist (Form 36) was in fact the Unit 1 drawing. This drawing referenced on the Form 36 was not needed nor used for this inspection. However, the cable number from the determination card was correct which was used by the inspector to document that the correct cable had been determined. The cable determination was accomplished on 11/11/87. The inspection was performed on 11/16/87. The inspection consisted of verifying that the proper cable had been abandoned, (i.e. proper taping of exposed conductors and proper coil radius.)

Item 3.1.1 of the QC checklist (Form 36) was "acceptable" because the correct cable, 2VA720, had been correctly abandoned in accordance with the requirements of L.K. Comstock procedures 4.8.9. The drawing referenced on the determination card did exist; it is the same Unit 1 drawing discussed in the previous paragraph. The unit designation "-2-" listed preceding the drawing number 4465B is however incorrect. The Unit designation "-0-" should have been used.

The remarks section of the Form 36 did list the termination points in the Unit 1 panel for the identical cable in Unit 1 "-1VA720-" which was also abandoned for the same reason as the Unit 2 cable. The termination points listed on the Form 36 were copied off the Unit 1 drawing by the inspector because determination work had been performed prior to the time of the inspection and the cable was off and coiled.

CORRECTIVE ACTION TAKEN AND RESULTS ACHIEVED:

The determination card and the Form 36 in question have been corrected to reflect the correct information.

CORRECTIVE ACTION TAKEN TO AVOID FURTHER VIOLATION:

The record of overview inspections, performed by the independent testing agency, on the work of the inspector in question has been reviewed. This review revealed that during 525 overviews performed on inspections conducted by this inspector on cable pulling operations (which require the verification of the same attributes as abandoning a cable, i.e. cable number verification, bend radius verification and verification of proper taping procedures) a 100% acceptance rate of the work of the inspector was achieved. Based on this, Commonwealth Edison believes this to be a unique and isolated occurrence. No further corrective action or inspections are required in this case.

DATE OF FULL COMPLIANCE:

Full compliance has been achieved.

VIOLATION: (457/87036-04A, 457/87036-04B, 457/036-04C, 457/87036-04D AND 457/87036-04E)

10 CFR 50, Appendix B, Criterion X, as implemented by Commonwealth Edison Company (CECO) Quality Assurance Manual, Nuclear Generating Stations, Section 10, requires that "Inspection program will be established to provide assurance that quality control . . . inspections . . . are performed. Quality Assurance inspection and testing will be conducted . . . to verify conformances to applicable drawings, instructions, and procedures as necessary to verify quality. Written procedures of checklists will be used to specify and verify final inspections and tests."

Contrary to the above, the following examples of failure to assure that quality control inspections were properly executed to verify conformance to applicable drawings and procedures were identified.

- a. Connection diagram 20E-2-4089K, Revision J, and Engineering Change Notice (ECN) No. 36345 required that the black and white conductors of cable 2MS683, located in Remote Shutdown Panel 2PL05J, be terminated to TB7-40 and 39, respectively. However, the inspector found the conductors of this cable terminated in reverse. The latest Q.C. inspector checklist for cable 2MS683, dated April 14, 1987, indicated in Step 3.1.2 that the cable was inspected and found terminated per the latest drawing and the ECN. (457/87036-04A)
- b. The black conductor of cable 2MS286, terminated to TB7 point 11S in Remote Shutdown Panel 2PL05J was observed to be very loose (at least three full turns). This conductor is used to provide the signal to close MSIV 2MS001B on an ESF actuation. In addition, an internal conductor installed by the licensee at point 1F on Auxiliary Exhaust Fan OC control switch OHS-VA007 at panel OPM02J was found to be loose. The latest QC inspection checklists for the cable and the conductor indicated that all lug connections were found to be tight at the termination points and were acceptable. (457/87036-04E)
- c. Safety related flexible conduit C2A17J8 routed to MSIV Junction box 2JB499A was observed to be in physical contact with a bare section of an insulated chemical injection pipe. The latest inspection checklist applicable to the installation, dated March 25, 1987, indicated in Section 6.2.d., that the required 3" clearance between the pipe and the electrical flexible conduit was satisfactory. (457/87036-04B)
- d. The metal cover plates for diesel generator skid termination boxes 2DG01KA and 2DG01KA-P were observed to be unsecured. Sixteen bolts were missing from the cover plate for 2DG01KA while six bolts were missing from the cover plate for 2DG01KA-P. Also, the backplate inside 2DG01KA, which supports eight terminal blocks, was secured by only one of four required bolts. These deficiencies were not identified on the Electrical Maintenance Department Turnover Review Checklist. (457/87036-04C,

- e. The shields for instrument cables terminated to devices F82 and F83 in panels 2PL075 and 2PL085 were bolted together, untaped, and laying inside the panel wireways. The LKC inspection checklists for these cables indicated acceptable terminations even though no such method of termination was available for review in the applicable procedures. (457/87036-04D)

RESPONSE: (457/87036-04A)

Commonwealth Edison acknowledges that the conductors were terminated in reverse. It should be noted that the "As Found" positions of the black (point 39) and white (point 40) conductors, while not in agreement with the wiring diagram (pictorially correct), they were electrically functional (schematically correct). There was no safety significance related to the "As Found" position.

CORRECTIVE ACTION TAKEN AND RESULTS ACHIEVED:

Field Change Request (FCR) L25419 was issued resulting in the correction to drawing 20E-2-4089K to reflect the field conditions.

Additionally, L.K. Comstock was directed to conduct a review of 100 randomly selected cables (approximately 600 conductors) to determine the generic implications of this concern. The L.K. Comstock review found all 100 cables to be terminated in accordance with the applicable wiring diagram. Based on this result, it was determined that:

1. Quality Control inspections have been properly executed, and;
2. The item in question was an isolated occurrence.

The results of this review are documented in L.K. Comstock report 87-03-1. The implementation of this review was also overviewed by the Commonwealth Edison Site Quality Assurance Department. The results are documented in Braidwood Quality Assurance Surveillance Report Number 7517.

CORRECTIVE ACTION TAKEN TO AVOID FURTHER VIOLATION:

None required based on the acceptable results of the 600 conductor sample review.

DATE OF FULL COMPLIANCE:

Full compliance has been achieved.

RESPONSE: (457/87036-04B)

Commonwealth Edison acknowledges that the flexible conduit C2A17J8 was in contact with a bare section of an insulated chemical injection pipe (temperature <180 °F). The circumstances leading to the clearance being less than 3 inches are unknown. At the time, the inspection was performed by the Quality Control inspector the 3 inch clearance may have existed, however, due to further construction activities this clearance may have changed.

CORRECTIVE ACTION TAKEN AND RESULTS ACHIEVED:

L.K. Comstock Inspection Correction Report (ICR) number 18988 was issued resulting in clearance notification form (CNF) number 782 being generated. The CNF was subsequently evaluated by Sargent and Lundy and the installation was found to be acceptable as-is.

CORRECTIVE ACTION TAKEN TO AVOID FURTHER VIOLATION:

In June and July of 1987, a field walkdown was performed by Sargent and Lundy per the requirements of S&L procedure PI-BB-96, "Limited Clearance Walkdowns". This walkdown verified that items requiring engineering analysis of as built clearances were addressed. The subject installation was not evaluated or identified during this walkdown due to it being outside the walkdown criteria for inclusion (pipe temperature less than 180 °F).

DATE OF FULL COMPLIANCE:

Full compliance has been achieved.

RESPONSE: (457/87036-04C)

Commonwealth Edison acknowledges that the bolts were loose on the identified junction box plate. At the time of the discovery the Diesel Generator was not required to be operable. This condition had no impact on the functional operability of the Diesel Generator.

CORRECTIVE ACTION TAKEN AND RESULTS ACHIEVED:

Nuclear Work Request 18176 was written on 12/17/87 to tighten the bolts. The bolts on the base plate and the cover plate were reinstalled.

CORRECTIVE ACTION TAKEN TO AVOID FURTHER VIOLATION:

Junction boxes are routinely examined as part of the Diesel Generator teardown surveillance to assure proper installation condition.

DATE OF FULL COMPLIANCE:

Full compliance has been achieved.

RESPONSE: (457/87036-04D)

Commonwealth Edison Company acknowledges that the instrument cable shields in panels 2PL07J and 2PL08J were bolted to each other and laying untaped in the plastic wireway. The detail utilized for the installation of the "splice" was attachment "E-1" instead of attachment "E-3" of L.K. Comstock procedure 4.3.9. Both "E-1" and "E-3" are approved methods. Attachment "E-1" describes the method to be used for the installation of a termination lug and insulating material on ground wire. This methodology was used for both wires which were to be "spliced". The ground wires were then bolted together to form the "splice" which was then laid in the plastic wireway.

CORRECTIVE ACTION TAKEN AND RESULTS ACHIEVED:

The installation was discussed with PWR Engineering and the preferred installation would have been to use Attachment "E-3", a butt splice. However, the installation is acceptable as it is installed. The ground wire will perform its intended function. To address the NRC inspector's concern the "splice" was taped to provide further insulation.

CORRECTIVE ACTION TAKEN TO AVOID FURTHER VIOLATION:

The as installed installation is acceptable.

DATE OF FULL COMPLIANCE:

Full compliance has been achieved.

RESPONSE: (457/87036-04E)

During the inspection prompt corrective actions were taken by Braidwood Station to inspect, identify, and correct additional problems with loose terminations. The inspector reviewed the corrective actions and determined that they were satisfactory to resolve this issue. Therefore, no further response to this item was required.

VIOLATION: (456/87038-05 AND 457/87036-05)

10 CFR 50, Appendix B, Criterion XVI, as implemented by Commonwealth Edison Company Quality Assurance Manual, Nuclear Generating Stations, Section 16, requires that measures be established to assure that conditions adverse to quality such as deviations nonconformances, deficiencies . . . which are adverse to quality and might affect the safe operation of a nuclear generating station are promptly identified and corrected.

Contrary to the above, the following example of failure to promptly correct identified deficiencies was identified.

Numerous examples were identified in which the nameplates and wiring designations on safety related components such as junction boxes, switches, MCC compartments, valves, cables, panel termination strips, etc. . . did not conform to the latest design drawings. The inspector determined that the licensee had also identified numerous deficiencies with nameplates and designations during the engineering verification conducted during the later part of 1986. Certain of these deficiencies were identical to those identified during this inspection. No documented evidence was available for review during this inspection to indicate that corrective action had been initiated to resolve this issue.

RESPONSE: (456/87038-05 AND 456/87036-05)

Commonwealth Edison acknowledges that corrective actions were not 100% complete at the time of the inspection. In 1986 L.K. Comstock work instruction WI-4.3.16-01 established the methodology to be utilized to document the status of internal and external wiring of safety related panels and equipment. Section 4.4 of this work instruction required that "permanent labels for devices inside and outside panels shall be verified" and "missing or incorrect" labeling be documented. All field walkdowns were completed in 1987 and correction of labeling deficiencies proceeded on a low priority basis. Braidwood Station also has a labeling program that identifies and corrects deficiencies in valve taggings.

CORRECTIVE ACTION TAKEN AND RESULTS ACHIEVED:

Initial field walkdowns are complete. Field replacements/corrections are complete. Re-verification of replacements/corrections is complete except as noted below:

1. 4KV switchgear: field re-verifications complete - 4 corrections in process.
2. Motor Control Centers: field re-verifications complete - 19 corrections in process.
3. Miscellaneous equipment and panels: field re-verification in process.

CORRECTIVE ACTION TO AVOID FURTHER VIOLATION:

None required

DATE OF FULL COMPLIANCE:

Field replacements/corrections are expected to be completed by June 1988.

DEVIATION (456/87038-01 AND 457/87036-01)

As a result of the inspection conducted on October 5 through December 22, 1987, January 19, February 18 and 26, 1988 and in accordance with 10 CFR, Part 2, Appendix C - General Policy for NRC Enforcement Actions (1987), the following deviation to NRC commitments contained in Braidwood SER 1 was identified.

Paragraph 6.2.5. of the Braidwood SER concluded with respect to the Hydrogen Recombiner system that the two hydrogen recombiners at the Braidwood Site, including their associated piping and valves, would perform the intended hydrogen control function assuming any single active component failure coincident with loss of offsite power. However, the SER stated that this was contingent upon the recombinder discharge valves being kept open during normal operation; and that the applicant must ensure that appropriate administrative controls were instituted to maintain the discharge valves open. The SER further stated that the applicant had committed to satisfy this requirement.

Contrary to the commitment noted above, on October 6, 1987, the inspector determined that the Hydrogen Recombiner "B" Discharge Isolation valve OOG066 was left in the closed position for 40 days. The licensee had failed to establish appropriate administrative controls to ensure that the discharge valves were kept open.

RESPONSE:

Commonwealth Edison acknowledges that valve OOG066 was not re-opened when some associated testing was completed. This occurred because the appropriate mechanical lineup, BWOP OG-M2, did not address the position of the valve. This valve was inadvertently omitted during a conversion of the mechanical lineups from the VQ block of procedures to the OG block of procedures while the Byron and Braidwood operating procedures were being standardized.

It should be noted, however, that the procedure used for recombinder start-up, BWOP OG-10, addresses the proper positioning of the suction and discharge valves prior to initiating recombinder operation.

CORRECTIVE ACTION TAKEN AND RESULTS ACHIEVED:

Upon discovery, the valve was promptly restored to its required position. Upon determination that the mechanical line-up was deficient, a caution card was placed on valve OOG066's handswitch.

ACTION TAKEN TO AVOID FURTHER DEVIATION:

Procedure BWOP OG-M2 was revised on October 9, 1987. This revision incorporated the proper position for valve OOG066.

Due to a recurrence of the cited deviation on April 24, 1988, the caution cards on the OOG060 and OOG066 discharge valves were revised on April 26, 1988 to read: If valve OOG060/66 is found in the closed position this violates an NRC SER commitment. Immediately notify the SCRE for LCOAR evaluation.

A Technical Specification interpretation was approved on April 26, 1988 providing additional clarification/explanation of the SER commitment. During the SCRE's LCOAR evaluation this interpretation should be reviewed.

DATE OF FULL COMPLIANCE:

Full compliance has been achieved.