U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Reports No. 50-456/86005(DRS); 50-457/86004(DRS)

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

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

Facility Name: Braidwood Station, Units 1 and 2

Inspection At: Braidwood Site, Braidwood, IL

Inspection Conducted: January 28 through February 4, 1986

J J Harrison / for

Inspector: R. Mendez 2/18/86
Date

J J Harrison / for

Approved By: James W. Muffett, Chief 2/18/86
Plant Systems Section Date

Inspection Summary

Inspection on January 28 through February 4, 1986 (Reports No. 50-456/86005(DRS); 50-457/86004(DRS))
Areas Inspected: Routine, unannounced inspection of licensee action on previous inspection findings, 10 CFR 50.55(e) Reports, 10 CFR Part 21's Notifications and Bulletins. The inspection involved a total of 36 inspector-hours by one NRC inspector.
Results: Of the areas inspected no violations or deviations were identified.

DETAILS

1. Persons Contacted

Commonwealth Edison Company (CECo)

*G. E. Groth, Assistant Construction Supervisor
*P. Barnes, Regulatory Assurance Supervisor
*J. F. Phelan, Project Field Engineer
*A. J. D'Antonio, Regulatory Assurance Department
*T. W. Simpkin, Regulatory Assurance Department
*E. R. Netzel, QA Supervisor
*D. L. Cecchet, Project Licensing Engineer
N. Tomis, Project Operational Analysis Supervisor
K. Faber, Project OAD Engineer
J. Gieseker, Project Construction Engineer
L. Tapella, Project Construction Engineer
N. A. Schryer, Project Construction Engineer
T. Ronskoske, Project Construction Engineer
E. Wozniak, Project Construction Engineer
K. Torres, Project OAD Engineer

*Denotes those attending the February 4, 1986 exit interview.

The inspector also contacted other licensee and contractor personnel during this inspection.

2. Licensee Action on Previous Inspection Findings

a. (Closed) Violation (456/81014-02): As identified in a previous inspection report the separation barriers had not been installed between adjacent redundant post accident monitoring (PAM) indicators in the main control panel 1PM04J. Westinghouse specification 952538 requires the installation of these barriers. The licensee issued CECo nonconformance report (NCR) 323 on November 2, 1981,to install barriers between redundant divisions. The licensee closed Nonconformance Report (NRC) 323 on November 11, 1985. The closure of NRC 323 was based on the implementation of corrective actions performed under Westinghouse Field Change Notice (FCN) CCEM-10686A and Braidwood QA Surveillance Report No. 4999. The QA surveillance report stated that the minimum separation between redundant divisions complied with the requirements of IEEE 384-1977. The inspector physically verified that the required barriers were installed in control room panel 1PM04J between redundant PAM level and pressure indicators. This violation appeared to be an isolated incident which has been acceptably resolved.

b. (Closed) Unresolved Item (456/81014-03): This item concerns a lack of separation between cables connecting PAM pressure and level indicators and inside Main Control Panel 1PM04J. A subsequent review by Westinghouse determined that internal wiring connected to redundant Class 1E components inside the main control board was required to be

covered with a metal cable braid in accordance with Westinghouse specification 952538. The work to install the metal braid was performed concurrently with the installation of the metal barriers mentioned in Paragraph "a". On October 2, 1985, Braidwood QA performed a surveillance and found that safety related wiring in panel 1PM04J contained the metal braid. The inspector verified that cables connecting the PAM level and pressure indicators were covered with the metal braid, this acceptably resolves this issue.

c. (Closed) Violation (456/83018-06A): It was previously identified that cable Kellum grips were not supporting cables in cable tray risers. Subsequent walkdowns and surveys by the licensee determined that in addition, some of the cable grips were the wrong size for the particular application and that certain cable grips such as the Economy single "u" supplied by Quickly Applied Split Cable Grip was unacceptable per S&L Standard STD-EB-200. The licensee initiated nonconformance reports (NCR's) numbers 429 and 595 to replace the unapproved cable grips and to ensure that cables were properly supported. The supplements to the NCR's also required that L. K. Comstock (LKC) purchasing and receiving be instructed not to purchase or receive grips not conforming to the applicable S&L standards. In addition, LKC installation crews were instructed not to install the nonconforming grips. Furthermore, QC inspectors performed cable grip surveys throughout the containment and the auxiliary building. The grips were checked for proper support of cables and proper circumference per S&L Standard STD-EB-200. On November 11, 1985 both of the above NCR's were closed. The inspector performed a walkdown and verified cable tray risers 2R302 C2E, 2R330 C1E, 2R302 C2E, 2R330 C1E, 1R294 C2E and 1R370 C2E. The installations were observed to be acceptable.

d. (Closed) Violation (456/83018-06F): It was previously identified that QC inspections failed to document the following:

- The identification number of the torque wrench used to torque bolts on electrical penetrations.

- The calibration due date of the torque wrench.

- The actual torque value applied to the penetration flange bolts.

The inspector reviewed Section 3.5.6 of LKC Procedure 4.3.17, "Electrical Penetration Installation, Termination and Maintenance" which now requires documentation of the torque wrench number, calibration due date and actual torque value applied. The licensee issued rework requests to loosen and retorque flange bolts on all 49 Unit 1 electrical penetration using the torque values and sequence specified in Procedure 4.3.17. The rework travelers and QC inspection checklist were reviewed and found acceptable.

e. (Closed) Unresolved Item (456/83018-09; 457/83017-06): It was previously identified that the licensee lacked adequate acceptance criteria for mounting 1/2" bolts to motor control center channel sills. In addition, the use of 3/8" bolts which were used to mount the motor control centers was questioned during the original inspection. The licensee issued NCR number 596 which established the torque values of the mounting bolts to be 50 ft-lbs. In addition, the disposition supplement to the NCR prohibited the use of 3/8" bolts and required that only 1/2" bolts be used on the motor control centers. The inspector reviewed several mounting bolt QC inspection checklists and found these acceptable. In addition, the inspector verified that the bolts in motor control centers 1AP32E, 1AP24E, 1AP22E and 1AP21E were the required 1/2" bolts and were acceptable.

f. (Closed) Unresolved Item (456/83018-12): It was previously identified that test reports of electrical penetration insulation resistance activities did not reference a procedure nor reflect details of the tests performed. The licensee has developed a procedure entitled, "O.A.D. Electrical Penetration Assembly Procedure" which describes the proper method for performing tests and the minimum insulation resistance required for a particular applied test voltage. The inspector reviewed the procedure and test checklists. The procedure and checklist were found to be acceptable.

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

a. (Open) 10 CFR 50.55(e) (456/80001-EE; 457/80001-EE): "Intermittent Contact Operation of W-2 Switches." The manufacturer (Westinghouse) performed examinations on switches known to have experienced intermittent contact operation after installation. Internal contamination of the switch contacts was identified as the cause of the problem. The manufacturing process used to produce the switches was revised to include cleaning steps to reduce contamination during assembly of the switch. Westinghouse issued FCN CCEM-10660 to initiate corrective action and develop procedures to ensure proper installation of the W-2 switches. The licensee indicated that by November 20, 1985 all field work for replacement of W-2 switches for Unit 1 was complete. The inspector reviewed LKC rework travelers, and QC inspection checklists pertaining to the removal and installation of the new W-2 switches. In addition, the inspector toured the auxiliary building and verified serial numbers of the W-2 switches in the remote shutdown panel and diesel generator rooms agreed with the material receipt inspection serial numbers specified by the licensee documentation packages. However, the inspector observed that the W-2 switches on the diesel generator panels 1PL07J and 1PL08J had not been changed. The licensee indicated they would review this problem further. This 50.55(e) item remains open.

b. (Closed) 10 CFR 50.55(e) (456/84009-EE): The licensee identified a problem regarding spot weld electrical connections (stab joints) in Westinghouse MCC's. The problem involved loose wire strands connecting the compartment bus clips which in turn connect the MCC bus. Subsequently, Westinghouse furnished acceptance criteria for the two

wire sizes (No. 8AWG and No. 4AWG) involved. The acceptance criteria required that No. 4 cable shall have no more than 3 loose strands while the No. 8 shall have no loose strands. The licensee conducted a 100% inspection of all safety-related motor control centers. Records indicate that the connections to the MCC clips not meeting the above acceptance criteria were replaced. The inspector verified that the stab joints in MCC's 131X2 cubicle D2, 132X4 cubicle D3 and 131X3 cubicle E3 met Westinghouse's criteria and are acceptable.

c. (Closed) 10 CFR 50.55(e) (456/85001-EE): The licensee identified deficiencies in the 10 amp 480V Westinghouse molded case breakers installed in MCC's. The 10 amp breakers had an interrupting capacity of about 4000 amps which was determined by the licensee to be inadequate to protect the pressure boundary of the electrical penetrations despite an additional 10 amp series breaker in the circuit. The licensee issued NCR 717 which required that all 10 amp thermal magnetic 480V breakers be replaced with 15 amp breakers. Westinghouse specifications indicate that the 15 amp breaker has an interrupting rating of 25,000 amps. The inspector reviewed rework travelers and QC records relative to the replacement of the breakers and found these acceptable. The inspector verified that the 10 amp breakers were replaced with 15 amp in MCC's 131X2 cubicle C3 and cubicle C4 and 131X3 cubicle B2B. In addition the licensee's drawings have been updated to reflect the correct breaker size in MCC's.

4. Licensee Action on 10 CFR Part 21 Reports

a. (Closed) Part 21 (456/84006-PP): Westinghouse identified a problem concerning a failure of the 7.5Kv static inverters. The cause of the failure was traced to the secondary side of the ferro-resonant transformer which shorted to ground. This type of failure would prevent the inverter from shutting down or tripping off-line. The ferro-resonant transformers were returned to the manufacturer for a fault analysis. The failure was determined to have been caused by electrical shorting between the coil and core. The manufacturer concluded that the transformers failed because the laminations making up the center leg of the core shifted and vibrated due to the fact that the core was insufficiently secured. On November 2, 1984 Westinghouse issued Bulletin NS110-TB-84-11 which proposed a high-potential leakage current test and outlined acceptance criteria to determine whether deterioration of the insulation had occurred. The licensee issued work requests Numbers A03306, A03307, A03308, A03309, A03310 which initiated action to perform high potential test on the spare ferro-resonant transformers and the transformers in the Braidwood Unit 1 inverters. The result of the tests indicate that none of the inverters exceeded the maximum leakage current of 2 milliamps as specified by the Westinghouse bulletin.

b. (Open) Part 21 (456/85001-PP; 457/85001-PP): Anchor/Darling identified a potential problem related to terminal blocks which may have been supplied as spare parts. The terminal blocks are manufactured using nylon and polysulfone material but only the

polysulfone material is environmentally qualified. The licensee indicated they had not received the Anchor/Darling letter which identified the potential problem and consequently could not provide information regarding its applicability to the Braidwood site. This Part 21 is open pending further review.

5. Licensee Action on Bulletins

a. (Closed) Bulletin (456/83-04-BB): This Bulletin was sent to inform the licensee of failures concerning General Electric (GE) AK-2 type circuit breakers to trip open during testing of the undervoltage (UV) trip function of reactor trip breakers. The particular failures of the GE breaker involved the UV trip attachment within the linkage mechanism. The Braidwood site does not utilize GE AK-2 breakers but employs Westinghouse type DS-416. However, the licensee had previously committed to perform the tests and take measurements of the UV trip attachment required by Bulletin 83004-BB. In addition, the Bulletin stated that the licensee must perform tests of the UV trip and shunt trip coils. Westinghouse issued FCN CCEM-10672 which required that the shunt trip attachment be changed on the reactor trip switchgear. Similarly, FCN 10652 was issued to change the undervoltage trip assembly. The inspector reviewed the documentation associated with the measurement checks, rework travelers, QC inspections, and tests performed on the two reactor trip breakers and two bypass reactor trip breakers for Unit 1. The documentation and results of the tests were found to meet the requirements of the Bulletin.

b. (Closed) Bulletin (456/85-02-BB): This bulletin was sent to inform the licensee of a faulty undervoltage trip attachment (UVTA) which did not provide sufficient lifting force to the breaker trip bar. The reactor trip breaker was identified as the Westinghouse Type DB-50. The bulletin identified a particular failure where upon UV trip, the force margin fell below 20 ounces. The requirements for the UVTA is to exert 50 ounces of force, 30 ounces to move the trip bar and 20 ounces for margin. As mentioned above the licensee utilizes DS-416 Westinghouse breakers and not the DB-50 mentioned in the bulletin. However, the licensee had previously committed to perform the trip force margin testing on the Unit 1 reactor trip and bypass breakers. Concurrent with replacement of the UV trip coils, the licensee performed the trip force margin testing in accordance with Westinghouse FCN CCEM-10652. The FCN required the UVTA to exert a total force of 48 ounces and for the trip load, to the breaker trip bar requires a force of less than 32 ounces (2 lbs.), leaving a trip margin of greater than 16 ounces. The following results were documented:

Reactor Trip Breaker	A	B
Push Force	17.0 ozs.	21.0 ozs.

Bypass Breaker	A	B
Push Force	18.1 ozs.	22.2 ozs.

To be acceptable these values must be less than 32 ounces per the acceptance criterion set by Westinghouse. The documentation of the test and the tests results were found acceptable.

6. Exit Interview

The inspector met with representatives (denoted in Paragraph 1) at the conclusion of the inspection. The inspector summarized the scope and findings of the inspections noted in this report. The inspector also discussed the likely informational content of the inspection report with regard to documents or processes reviewed by the inspector during the inspection. The licensee did not identify any such documents/processes as proprietary.