U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-461/85054(DRS)

Docket No. 50-461 License No. CPPR-137

Licensee: Illinois Power Company
500 South 27th Street
Decatur, IL 62525

Facility Name: Clinton Nuclear Power Station, Unit 1

Inspection At: Clinton Site, Clinton, IL

Inspection Conducted: October 7 through November 12, 1985

Inspector: R. S. Love R.S. Love 11/29/85
Date

Approved By: C. C. Williams, Chief R.D. Love for 11/29/85
Plant Systems Section Date

Inspection Summary

Inspection on October 7 through November 12, 1985 (Report No. 50-461/85054(DRS))
Areas Inspected: Routine, unannounced inspection of licensee activities in the area of: Allegations and construction deficiency reports. The inspector also accompanied NRR Power System Branch reviewer during his site visit. This inspection involved a total of 75 inspector-hours by one NRC inspector, including six inspector-hours in office reviewing NCRs.
Results: Of the areas inspected, no violations were identified. However, three open items (Paragraphs 3.b.(1), 3.b.(3), and 5.(i) were identified and requires additional followup by the inspector. Also, the NRR electrical review expressed one concern (Paragraph 5.e) that requires additional followup by NRR.

DETAILS

1. Persons Contacted

Illinois Power Company (IP)

*W. C. Gerstner, Executive Vice President
*D. P. Hall, Vice President
#*H. E. Daniels, Jr., Project Manager
#*J. E. Loomis, Construction Manager
#*F. A. Spangenberg, Manager, Licensing and Safety
#*J. S. Perry, Manager, Nuclear Programs Coordinator
*J. W. Wilson, Plant Manager
#*J. H. Greene, Manager of Startup
#*R. W. Greer, Manager, Quality and Technical Services (detailed to BA)
#*D. C. Shelton, Manager, NSED
#*G. W. Bell, Director, Construction and Procurement, QA
*W. Connell, Manager, Quality Assurance
*J. F. Palchak, Supervisor, Plant Support Services
#J. M. Emmert, Supervisor, Electrical Engineering
#A. L. Ruwe, Assistant Director, NSED
#S. E. Rasor, Supervisor, Construction, QA
#*K. A. Baker, Project Engineer, Licensing and Safety
D. W. Wilson, Supervisor, Licensing Administration
S. Satputa, Supervising Engineer, NSED
G. Bousquet, Quality Assurance Engineer
P. Thompson, Project Engineer, NSED
W. Assat, Control and Instrumentation Engineer, NSED
D. Falkenheim, Electrical Engineer, NSED
L. Holtman, Licensing and Safety
G. Lazarovirtz, Electrical Engineer, NSED
H. Master, Electrical Engineer, NSED
T. Mohammed, Electrical Engineer, NSED
R. Morton, Electrical Engineer, NSED
M. Munie, Mechanical Engineer, NSED
D. O'Brien, Control and Instrumentation Engineer, NSED
D. Parchem, Mechanical Engineer, NSED
J. Ray, Electrical Engineer, NSED
S. Satpute, Electrical Engineer, NSED
B. Shete, Mechanical Engineer, NSED
P. Thompson, Electrical Engineer, NSED
R. Berbort, Quality Assurance Engineer
E. W. Kant, Assistant Manager, NSED
A. Sherwood, Lead Quality Assurance Engineer

Baldwin Associates (BA)

#*E. P. Rosol, Project Manager
*J. L. Thompson, Quality Engineering Manager

Sargent and Lundy (S&L)

J. Wittenaur, Project Engineer
V. B. Naschansky, Electrical Project Engineer

General Electric Company (GE)

S. Garg, Principal Engineer

Illinois Attorney Generals Office (IAG)

#M. Jason, Assistant Attorney General

U. S. Nuclear Regulatory Commission (NRC)

#*T. P. Gwynn, Chief, Reactor Projects Section 1B
#J. Lazevnick, Electrical Reviewer, Power Systems Branch (NRR)

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

*Denotes those present at the exit interview on October 9, 1985.
#Denotes those present at the exit interview on October 30, 1985.

2. Followup on 10 CFR 50.55(e) Report

(Closed) 50.55(e) Report (461/84018-EE): IPQA identified 300 15"x15"x½" steel plates whose quality was indeterminate. These plates had been supplied by Interstate Steel and had been received at Clinton Power Station (CPS) on Receipt Inspection Report (RIR) No. S-12949. The certified material test report (CMTR) received with these plates indicated that they met the requirements of ASTM specification A-36 and the original, uncut plate was identified with Heat No. 8117721. The cut plate was also identified with this heat number. Retesting of a sample of the 300 plates showed that the physical properties (yield and tensil strength) were less than that required by the ASTM material specification. The CMTR was furnished by Phoenix Steel Corporation. Subsequently, Phoenix Steel performed a chemical analysis of two samples of this material and concluded that this material was not made by them. Phoenix Steel makes their steel from scrap and the analysis of trace chemical elements showed a purity not possible from the remelting of scrap material. This analysis was confirmed by an independent testing laboratory.

The root cause of this deficiency is attributed to the lack of material control by Interstate Steel and their subcontractor during the subdividing (cutting) of the steel plate furnished by Phoenix Steel. This was confirmed by a review of CMTRs, purchase orders, shipping invoices, and interviews. Interstate Steel was unable to show that the material that their subcontractor cut to size and shipped to CPS was the material shown on the CMTR. A list of all plate materials purchased from Interstate Steel was compiled. This list consisted of a total of 83 heats. Two plates from each of the 76 heats that were available from construction stock were sent to St. Louis Testing Laboratories for chemical and physical analysis. Eleven heats of material did not meet the yield and tensil strength requirements of the ASTM material specifications.

Subsequently, Sargent and Lundy (S&L) performed an evaluation of raceway support connection details to determine if the design requirements had been maintained with the reduced material properties. S&L used the minimum yield and tensile strength values applicable to the various plate thicknesses to evaluate the raceway support installations. This review identified the specific supports, by number, which could not be qualified with the lower strength valves. BA Resident Engineering reviewed the specific support travelers identified by S&L. This BA review identified the plate material supplied by Interstate Steel or was listed as "shear cut", i.e. no heat/RIR number on the material, for each of the travelers. As a result of the S&L and BA reviews, 88 nonconformance reports (NCR) were prepared. The last of these NCRs was closed on October 15, 1985. The inspector selected nine of these NCR's for review for proper closure, including S&L calculations on "Use-As-Is" dispositions. The inspector found the S&L calculations used as a basis to disposition these nine NCRs to be adequate and the "Use-As-Is" disposition was therefore justified. In addition to cable tray and conduit supports, the electrical equipment mounting details shown on S&L E05-1200 series drawings, were reviewed by S&L. This review concluded that the mounting details that used plate materials were not impacted by the reduced material properties of the plates.

Concurrent with the reviews discussed above, BA quality engineering (QE) and IP quality assurance (QA) verified that the electrical discipline was the sole user of the suspect material. No evidence was found to indicate that the suspect material was being used by other BA disciplines or by BA subcontractors.

3. Followup on Allegations

a. (Closed) Allegation RIII-85-A-0132

Concern

The alleger stated that electrical junction boxes 1JB034K, 1JB734K, and 1JB735K may not have been properly inspected.

NRC Review

During this inspection, the Region III inspector performed a physical inspection of the junction boxes and reviewed the installation/inspection records. It was observed that all three of the junction boxes were non-safety-related and that the II/I criteria was not applicable in that no safety-related items were installed under or in close proximity to the junction boxes.

- Junction Box (JB) 1JB034K-K2B is installed in the Control Building, Unit 2 side, at column lines 130/V, 805' elevation. This JB is welded to a structural "H" beam. The welds were inspected and found acceptable by Technical Services. Quality Control had inspected the JB for location, configuration, orientation, elevation, and damage. No discrepancies were identified.

The Region III inspector found the installation of this JB acceptable.

- Junction Boxes 1JB734K-K1B and 1JB735K-K2B are installed in the Containment Building at azimuth 177° 25', 740' elevation. These JBs are installed with concrete expansion anchors (CEA). Quality Control inspected and accepted: CEA hole size, CEA set and installation torques; and JB location, configuration, orientation, and damage.

  The Region III inspector also found the installation of these non-safety-related JBs acceptable.

Conclusions

This allegation could not be substantiated in that all three non-safety-related junction boxes were inspected and accepted by Quality Control and the welding had been accepted by Technical Services. Additionally, these junction boxes were found acceptable by the NRC inspector.

b. (Closed) Allegation RIII 85-A-0144

Concern

(1) The alleger stated that BA is installing non-safety/nonseismic instrumentation and equipment (area coolers, radiation monitors, radiation detectors, communication systems, etc.) in safety-related, seismic category I areas without quality program controls (including travelers and QC inspection). The individual believes that QC inspection of the mounting (only) is required in order to assure that safety-related equipment is not degraded by failure of the non-safety mounting. The individual also stated that BA was using Form BAE-073, Non-safety Equipment Modification Card, to install the above listed types of equipment. Form BAE-073 does not require QC inspection.

NRC Review

During this inspection, the Region III inspector performed a physical inspection of various types of non-safety-related equipment and reviewed the applicable installation/inspection records. Paragraph 3a of this report discusses the inspector's review of the installation of three non-safety-related junction boxes installed in a seismic category I building. In addition, the inspector reviewed selected non-safety-related installations including instruments, distribution panels, area coolers and lighting. It was observed that in many cases, non-safety-related items were being installed with the use of Form BAE-073, "Non Safety Equipment Field Modification Card." This is in accordance with approved BA procedures. Equipment installed with the use of Form BAE-073 is inspected by the discipline engineer, however, the equipment supports (mountings/hangers) for these items reviewed were installed with the use of a Traveler, Form JV-339.

Quality Control (QC) and Technical Services (TS) perform an initial review of the Traveler when it is prepared. At this time, QC and TS assign their witness and hold points, as applicable, to inform the craft personnel of the inspections to be performed. Subsequently, the required inspections are then performed and documented on the Traveler. During final review of the Traveler, QC and TS review the traveler to verify that all required inspections were performed and signed-off. In addition, anytime a non-safety-related item is welded to a safety-related item (structural steel, hanger, etc.), a 100% of the final welds are inspected by TS.

For the items inspected, no violations or deviations with the hardware or software (installation/inspection reports) were identified. However,when this item was discussed with the licensee, the inspector was provided a copy of BA's NCR 33,408 with the explanation that this NCR discussed the same concern. During a review of the designers (S&L) disposition, it was observed that S&L drawing E05-1200, sheet 1, required revision as follows: "Provide clarification to E05-1200 Sheet 1 Note 1 to be consistent with K-2999/PP110."

During a review of Note 1 on drawing E05-1200, Sheet 1, Revision U, dated September 3, 1985, and Paragraph 110 of the Electrical Specifications K-2999, Amendment 4, dated November 17, 1980, it was observed that if Note 1 was revised to be consistent with K-2999, the requirement to inspect non-safety-related installations in seismic Category 1 areas would be deleted. The licensee prepared IPQA Surveillance Finding C-85-158, dated October 14, 1985, to document this observation. S&L responded to the IPQA finding on October 30, 1985. The response indicates that Note 1 on drawing E05-1200, Sheet 1, and Paragraph 110 of specification K-2999 will both be revised to clarify the inspection requirements. As of November 1, 1985, the licensee had not completed their review of S&L's response for acceptability. Pending a review of IPQA Surveillance Finding C-85-158 for proper closure, this item is open (461/85054-01).

Conclusions

For all the various types of non-safety-related equipment reviewed, the inspector was shown records to indicate that QC and TS had, in fact, inspected the supports (mountings/hangers) when this equipment was installed in a seismic Category I building. In several cases, QC also inspected the item for other attributes including location and configuration. The allegation could not be substantiated. In conjunction with this allegation, the inspector observed that the disposition on NCR 33,408, if implemented, would delete the requirement to inspect the supports of non-safety-related equipment installed in seismic category I buildings. This is an open item and the inspector will followup on this during a subsequent inspection.

(2) Concern

The alleger stated that BA is using GE Control Room Assembly Procedures (CRAPs) for the installation/inspection of GE supplied equipment, both inside and outside the control room. CRAPs included in the installation procedures are not marked "Approved for Construction" as required for a controlled document; QC inspectors are unable to determine if the most recent revision of the applicable CRAP is being used for construction. The alleger also stated that some action was being taken as a result of an NCR in that BA is eliminating mention of the GE CRAPs from BAP 2.0, "Document Control Program," and upgrading BAP 1.15, "Control Room Assembly Procedures."

NRC Review

During this inspection, the Region III inspector reviewed a copy of the NCR, same subject, provided by the alleger and procedure BAP 1.15. The designer (S&L) disposition on this NCR states in part, "A Revision to BAP 1.15 has already been initiated to clarify existing use of CRAPs as being exempt from requirements of BAP 2.0." BAP 2.0, "Document Control," indicates that drawings, specifications, instructions, etc. will be identified with an "Approved for Construction" stamp before it is issued to the field for construction activities.

Subsequent to the initiation of the NCR provided by the alleger, Paragraphs 5.4 and 5.5 of BA procedure BAP 1.15 was revised to read as follows:

- Paragraph 5.4 - "The Resident Engineer shall process revisions to Control Room Assembly Procedures in the same manner as the original issue."

- Paragraph 5.5 - "Control Room Assembly Procedures are exempt from the requirements of BAP 2.0, Document Control, for control and approval. Each Control Room Assembly Procedure will be an attachment to a traveler and will be controlled under BAP 2.32, Document Control."

With respect to the alleger's concern that QC inspectors were unable to determine if the current revision of the CRAP was being used for construction, this information can be obtained by calling or visiting the GE Field Office or the BA Resident Engineering Office

Conclusions

With respect to the allegers concern that Control Room Assembly Procedures (CRAPs) are not being identified with an "Approved for Construction" stamp, this concern was substantiated. However, although these CRAPs were not identified with an Approved for Construction stamp, they were being controlled

through the Traveler revision process. BA procedure BAP 1.15 has been revised to clarify that CRAPs are exempt from the requirement of the Document Control Procedure. With respect to the concern that QC was unable to determine the latest revision of a CRAP, this information is available from GE or BA.

(3) Concern

The alleger stated that he brought his first concern ((1) above) to the attention of an IPQA engineer (by name), but that IPQA had not acted promptly on his concern. In addition, the alleger stated that he brought his second concern ((2) above) to the attention of the BA QCE Level III (by Name) with no apparent success.

NRC Review

During this inspection, the Region III inspector interviewed the subject IPQA engineer. The inspector was informed that: (1) he, the IPQA engineer, is a personal friend of the alleger and that he was instrumental in getting the individual employed at Clinton Power Station; (2) in the manner in which the alleger presented his questions, the IPQA engineer did not interpret these questions as an allegation, but promised the individual that he would look into his questions (this discussion occurred on approximately July 23, 1985,); (3) on July 25, 1985, the IPQA engineer was placed in the hospital for an operation and he was off work for eight weeks; (4) on approximately October 3, 1985, he and the alleger again discussed his questions of July 23rd. The engineer told the alleger he had just returned to work and that he had not forgotten the alleger's questions. The engineer stated that the alleger said that he understood and that he was in no hurry for the answers. (The alleger presented his concerns to the NRC on August 1, 1985, approximately nine days after he talked to the IPQA engineer).

Subsequent to the interview, the subject IPQA engineer entered the allegers questions into the IP allegation tracking system. The allegers concerns are being investigated by an IPQA Electrical Engineer. Pending a review of IP's investigation of this matter, this item is open (461/85054-02).

In that the BA Level III QCE (by name) is no longer employed at Clinton Power Station, the inspector was unable to interview this individual.

Conclusions

With respect to the concerns brought to the attention of the IPQA engineer, this allegation was substantiated, however, in the manner presented, the engineer did not perceive the individual's questions as an allegation. Subsequently, the alleger's questions have been entered into IP's allegation tracking system.

With respect to the concerns brought to the attention of the BA Level III QCE, in that the individual is no longer employed at the Clinton Power Station, this allegation could not be substantiated nor refuted.

4. Overinspection Program

During this inspection, the Region III inspector reviewed the 65 NCR prepared to document electrical cable termination errors. These deficiencies were identified by the IP Overinspection Program and reported to Region III by D. P. Hall's letter to James G. Keppler dated October 11, 1985. Each NCR identifies one or more termination errors for a total of 173. If it were assumed that overinspection had not identified these deficiencies, all, except approximately 77 of these termination errors would have been identified during startup testing. These 77, with one possible exception, would not affect plant operations. The one possible exception involved an equipment ground that was not terminated at an instrument rack in accordance with the design drawings. Typical examples of the type of discrepant terminations that would not be identified by startup is as follows:

- Spare conductors were/were not terminated on a spare terminal.
- Motor leads were reversed to provide proper motor rotation, however, the drawings were not updated,
- Design changes were implemented without a traveler; i.e., no records to indicate that the revision was implemented and terminations inspected.
- Conductors to a coil/contacts reversed.
- Inspection error by the overinspection inspector.

No violations or deviations were identified.

5. Power Systems Branch (NRR) Site Visit

During this inspection, the Region III inspector accompanied the NRR Power Systems Branch (PSB) electrical reviewer during his site visit. The site visit concentrated on those areas which will aid the staff in resolving outstanding and confirmatory issues listed in Chapter 8 (Electric Power System) of the Clinton SER. During this site visit, the following was accomplished:

a. Reviewed the electrical separation tests that were performed to establish minimum allowable separation distances between redundant safety related cables/raceways and between safety related and non-safety-related cables/raceways. The licensee's proposed revision to Chapter 8 of the FSAR was also reviewed in conjunction with the test data.

b. The following items were inspected/reviewed in the Control Room:

- Diesel Generator (D/G) control board and the D/G inoperable status alarms.
- Power system control and mimic panel.
- DC power system monitoring and alarm panel.
- Separation of wiring in the PGCC floor raceway, including examples of redundant overcurrent protection for circuits in flexible conduits.
- Separation of wiring in control cabinets, including examples of non Class 1E instrumentation wiring routed with or in close proximity to Class 1E circuits.

c. With respect to cable installation in the cable spread rooms and in the general plant areas, the following items were inspected/reviewed:

- General layout of redundant raceway and Class 1E to non Class 1E raceway and relationship between power, control, and instrument raceway.
- Degree of separation, including examples of area where tests and analysis were used to justify separation.
- Electrical penetrations and cable terminations.
- Identification of cables and raceway.
- Separation of field run cables (lighting, communications, welding outlets, etc.) from safety related cables.

d. The following items were inspected/reviewed in the electrical switchgear area:

- General layout as to the physical and electrical separation of redundant units.
- Cable installation, terminations, and separation inside switchgear and motor control centers.

e. Reviewed the general layout of the Class 1E batteries (4) and their associated battery charger, MCC, distribution panel and accessory equipment as to their physical and electrical separation. Also, reviewed the monitoring instrumentation and alarms associated with each battery. Verified that the lights installed over each battery were seismically qualified. It was observed that two of the battery rooms contained emergency eyewash stations that were not seismically mounted. The electrical reviewer expressed a concern that a line break could spray water on top of the batteries, causing a possible degradiation of the batteries. The licensee will respond directly to NRR on this matter.

f. Reviewed the general layout of the three divisional diesel generators and accessory equipment as to their physical and electrical separation.

g. During a tour of the switchyard, reviewed the physical and electrical separation of transmission lines, busses, circuit breakers and control circuits. It was observed that the off-site a-c power supply to the Reserve Auxiliary Transformer is provided by three 345KV transmission lines through a ring bus. Also, off-site a-c power to the Emergency Reserve Auxiliary Transformer is supplied by one 138KV transmission line. To ensure that the failure of one line cannot cause the failure of all lines, the 138KV line does not enter the 345KV switchyard.

h. Reviewed the separation of piping and electrical cabling to redundant equipment within the Reactor Building.

i. Reviewed the Reactor Protection System (RPS) power supplies (inverters, batteries, battery chargers, distribution panels, and power monitors) for the scram solenoids and main steam isolation valve (MSIV) solenoids. The power supply for these items is from a non Class 1E source. Verified that the inverters were procured and qualified (electrically and seismically) as Class 1E equipment even though they are classified as non-safety-related.

During this inspection, the licensee was unable to provide assurance that these RPS power supplies would be treated as Class 1E equipment under the licensee's storage and maintenance (S&M) program. Region III was requested to followup on this item. Pending verification that these power supplies, equipment numbers 1C71-S004A and 1C71-S004B, have been incorporated into the Class 1E S&M program, this item is open (461/85054-03).

j. During a tour of the plant, reviewed the Engineered Safeguard Features (ESF) and Vital Instrumentation Power Supply equipment for: general layout; physical and electrical separation of redundant items; monitoring instrumentation; and identification of cables, raceway, and equipment.

k. Utilizing system drawings, reviewed:

- as-built D/G control drawings showing (1) bypassing of protective trips on Safety Injection Actuation System (SIAS) and (2) SIAS overrides test mode to permit response to SIAS signal.

- relay protection schematics showing sensing and switching arrangements of the first and second level undervoltage protection relays.

- as-built schematics showing thermal overload bypass.

- as-built schematics showing automatic disconnection of non-safety loads from the safety busses upon receipt of a injection signal.

- RPS drawing showing inverter, battery, battery charger, alternate power supply, and connection of power monitor.

1. Utilizing FSAR drawings, performed a walkdown of the electrical power and control system associated with the Residual Heat Removal (RHR) system.

During the site visit by PSB, no violations or deviations were identified. However, two open items requiring NRC followup were identified (Reference: Paragraphs 5.e and 5.i). The details of the NRR PSB reviewer's site visit will be documented in a forthcoming Trip Report.

6. Open Items

Open items are matters which have been discussed with the licensee, which will be reviewed further by the inspector, and which involves some action on the part of the NRC or licensee or both.

7. Exit Interview

The Region III inspector met with the licensee representatives (denoted under Paragraph 1) at the conclusion of the inspection on October 9 and October 30, 1985. The inspector summarized the purpose and findings of the inspection. The inspector also discussed the likely informational content of the inspection report with regard to documents or processes reviewed during the inspection. The licensee acknowledged this information and did not identify any such documents or processes as proprietary.