

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Reports No. 50-454/85049(DRS); 50-455/85034(DRS)

Docket Nos. 50-454; 50-455

Licenses No. CPPR-130; CPPR-131

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

Facility Name: Byron Station, Units 1 and 2

Inspection At: Byron Site, Byron, IL

Inspection Conducted: November 18-22, December 9-12, 1985, and January 10, 1986

Inspector: *W. G. Galdemond*
C. Ramsey

1-15-86
Date

Approved By: *W. G. Galdemond*
W. G. Galdemond, Chief
Operational Programs Section

1-15-86
Date

Inspection Summary

Inspection on November 18-22, December 9-12, 1985, and January 10, 1986
(Reports No. 50-454/85049(DRS); 50-455/85034(DRS))

Areas Inspected: Routine unannounced safety inspection conducted to closeout open items and verify the adequacy of routine fire protection program implementation. The inspection involved 63 inspector-hours including eight inspector-hours during off-shifts and nine inspector-hours conducting in-office review at the Region III office. The following inspection procedures were used during this inspection: 30703, 64703, and 92701.

Results: No violations were identified in any of the areas inspected.

DETAILS

1. Persons Contacted

Commonwealth Edison

- *R. C. Ward, Services Superintendent
- R. Pleniewiez, Production Superintendent
- *M. Dellabetta, Construction Q.A. Supervisor
- *W. Burkamper, Operations Q.A. Supervisor
- *A. J. Chernick, Compliance Supervisor
- M. Snow, Assistant Compliance Supervisor
- *W. Pirnot, Compliance
- J. Ianya, Compliance
- *C. Diaz, Fire Protection Engineer
- K. A. Sullivan, Unit 2 Fire Protection
- R. Cassidy, Fire Marshal
- *K. Yates, Nuclear Safety
- S. F. Noslzo, Q.A. Engineer

NRC

- J. M. Hinds, Senior Resident Inspector
- *J. A. Malloy, Resident Inspector

*Denotes those in attendance at the exit meeting.

2. Licensee Actions on Previous Inspection Findings

- a. (Closed) Unresolved Item (454/83-62-11(DRS)): Unit 1 unsealed penetration openings in fire barriers and unprotected structural steel concerns. This item is closed based on the licensee's corrective actions taken.

The licensee's January 7, 1985 internal correspondence (G. Sorensen to R. Cassidy and R. Tuetken) indicated that a final walkdown of fire barrier penetration seals and fire rated assemblies (including blunt structural fire proofing) was performed by Tech Sill Inc. In addition, Transco Products Inc letters dated October 29, 1984, November 5, 13, 14, 20, 26, December 3, 10, 17, 24, 31, 1984, January 11 and 14, 1985 indicate that proper installation of all electrical penetration seals and cable pan fire proofing was complete. During plant tours of selected Unit 1 areas by the inspector, all such installations observed appeared to be complete.

- b. (Closed) Violation (454/84-76-01a(DRS)): Lack of requirements to ensure the adequacy of penetration seal fill depths. This item is closed based on the licensee's corrective actions taken which are stated in DRS Inspection Report No. 50-454/84-76.

- c. (Closed) Violation (454/84-76-01b(DRS)): (1) Adequate cell structure for silicone radiation seals and (2) Inadequate acceptance criteria for fire code CT Gypsum fire barrier penetration seals. This item is closed based on the licensee's corrective actions taken which are stated in DRS Inspection Report No. 454/84-76.
- d. (Closed) Open Item (454/84-76-03; 455/84-51-02(DRS)): Survey results of four conduit penetration openings for radiation streaming. This item is closed based on the licensee's corrective actions taken.

For the four conduits in question, the licensee took surveys during Unit 1 power escalation to determine the level of radiation streaming. Two of the four conduits (all of which are normally inaccessible and over ten feet above floor level) now have radiation seals installed.

The conduit penetration opening through the spent resin pump room on the 401 foot elevation of the Auxiliary Building (Fire/Radiation Barrier Impairment (FBI) No. N264) was sealed by Penetration Seal No. 2033 prior to Unit 1 exceeding low power levels. Weekly survey results showed that radiation streaming through this opening was less than 1 mR/hr prior to installation of the seal.

The conduit penetration opening through the resin tank cubicle on the 426 foot elevation of the Auxiliary Building (FBI No. 265 Penetration Seal No. 20104) was sealed prior to Unit 1 initial criticality.

The two conduit penetration openings that were not sealed (FBI No. N266, Seal No. 2512, and FBI No. N267, Seal No. 2513) involve penetration openings on opposite sides (east and west) of the Unit 1 VCT tank room, adjacent to the south wall. During Unit 1 escalation to 100 percent power the licensee took weekly surveys in the vicinity of both conduit penetration openings that demonstrate that radiation streaming levels have been less than 1 mR/hr.

The design dose rate for conduit Penetration No. 2512 is 1.0 mR/hr.

The design dose rate for conduit Penetration No. 2513 is 1.0 mR/hr.

This item is closed.

- e. (Open) Open Item (454/85-005-01(DRS)): Relocation of emergency lighting for Unit 1 remote shutdown panel.

Modification Package No. M6-185-0427 was issued on March 20, 1985 to relocate emergency lighting at the Unit 1 remote shutdown panel in response to this NRC concern. At the time of the inspection this work was not completed. According to the licensee, the expected completion date will be approximately March 1986. This item will remain open pending verification by Region III.

- f. (Closed) Unresolved Item (455/83-042-01(DRS)): Adequacy of preoperational test procedures.

This item is closed based on the inspector's review of a selected sample of preoperational test procedures for fire protection systems. System Demonstration Test Nos. 2.14.70, 2.14.71, 2.33.70 and 2.33.71 contained appropriate instructions and acceptance criteria for preoperational testing of Unit 2 fire protection systems in accordance with design and governing code requirements.

- g. (Closed) Unresolved Item (455/83-42-02(DRS)): Use of service water pumps as a backup to the station fire pumps.

This item is closed based on NRR acceptance of this condition for Unit 1. The pumps and fire water supply arrangement are common for both units. This item was closed for Unit 1 in Region III Inspection Report No. 454/84-74(DRS).

- h. (Open) Unresolved Item (455/83-42-03(DRS)): Unsatisfactory Halon and CO₂ preoperational test results.

Preoperational testing of Halon and CO₂ extinguishing systems for Unit 2 was incomplete at the time of this inspection. This item will remain open pending further verification by Region III.

- i. (Open) Unresolved Item (455/83-42-04(DRS)): Unsealed penetration openings in fire barriers and unprotected structural steel concerns.

Sealing of penetration openings through fire barriers and membrane protection of structural steel for Unit 2 was incomplete at the time of this inspection due to continuing construction activities. According to the licensee, where such fire barrier penetration openings are not sealed or structural steel is unprotected prior to Unit 2 initial criticality, compensating measures similar to those carried out for Unit 1 will be implemented.

The inspectors informed the licensee that the adequacy of any proposed compensatory measures must be determined acceptable by NRR. This item will remain open pending further verification by Region III.

- j. (Closed) Unresolved Item (455/83-42-05(DRS)): Unqualified components installed in fire pump assemblies.

This item is closed based on the licensee's resolution to these concerns for Unit 1. The station fire pumps are common for both units. The licensee's resolution to this concern for Unit 1 is discussed in Region III Inspection Report No. 455/84-74(DRS).

- k. (Closed) Unresolved Item (455/83-42-06(DRS)): Inadequate protection of safety-related battery rooms.

This item is closed based on the licensee's corrective actions taken. The licensee has installed rated fire barrier assemblies which completely separate safety-related battery rooms from other areas of the plant. Ventilation inside the battery room enclosures was determined adequate to maintain hydrogen concentrations below the lower explosive limit (LEL) as discussed in the closure of this item for Unit 1 in Region III Inspection Report No. 454/84-74(DRS). Furthermore, the licensee installed additional fire hose stations to enhance manual fire-fighting capabilities for the Unit 2 battery rooms in the same manner that this capability was provided for the Unit 1 battery rooms.

- l. (Open) Unresolved Item (455/83-42-07(DRS)): Inadequate fire detection system design.

The licensee's review of Unit 2 fire detection system designs was incomplete at the time of this inspection. This item will remain open pending further verification by Region III.

- m. (Closed) Unresolved Item (455/83-42-08(DRS)): Inadequate construction of yard hydrant hose houses.

This item is closed based on the licensee's corrective actions taken for this concern as it pertains to Unit 1. The yard hydrant hose houses are common for both units. The closure of this concern for Unit 1 is discussed in Region III Inspection Report No. 454/84-60(DRS).

- n. (Open) Unresolved Item (455/83-42-09(DRS)): Supervision of control and sectionalizing isolation valves in the fire water system.

At the time of this inspection, the licensee had not determined the method of supervision for control and sectionalizing isolation valves in the Unit 1 portion of the fire water system. This item will remain open pending further verification by Region III.

- o. (Open) Unresolved Item (455/83-42-10(DRS)): Unit 2 remote shutdown panel concerns.

The Unit 2 remote shutdown panel installation was incomplete at the time of this inspection. This item will remain open pending further verification by Region III.

- p. (Open) Unresolved Item (455/83-42-11(DRS)): Unit 2 control room concerns.

Construction activities on the Unit 2 control room were ongoing at the time of this inspection. This item will remain open pending further verification by Region III.

- q. (Closed) Unresolved Item (455/83-42-12(DRS)): Boric acid transfer pump concerns.

This item is closed based on the licensee's Unit 1 safe shutdown analysis. According to the Unit 1 analysis, the boric acid transfer pumps are not required for postfire safe shutdown. This position is applicable to Unit 2. This concern was closed for Unit 1 in Region III Inspection Report No. 454/85-60(DRS).

- r. (Open) Unresolved Item (454/83-42-13(DRS)): Plant wide emergency lighting concerns.

At the time of this inspection, installation of Unit 2 emergency lighting units was incomplete. This item will remain open pending further verification by Region III.

- s. (Open) Unresolved Item (454/83-42-14(DRS)): Reactor coolant pump oil collection system design.

At the time of this inspection, the reactor coolant pump oil collection system installation for Unit 2 was incomplete. This item will remain open pending further verification by Region III.

- t. (Open) Unresolved Item (454/83-42-15(DRS)): Associated circuits concerns.

At the time of this inspection, the licensee's associated circuits review and safe shutdown analysis for Unit 2 was incomplete. This item will remain open pending further verification by Region III.

- u. (Open) Unresolved Item (454/83-42-16(DRS)): Spurious operation of equipment concerns.

At the time of this inspection, the licensee's analysis of Unit 2 equipment whose spurious operation could affect safe shutdown was incomplete. This item will remain open pending further verification by Region III.

- v. (Open) Unresolved Item (455/83-42-17(DRS)): Procedures for safe shutdown, staffing requirements, operator training and required repairs for cold shutdown concerns.

At the time of this inspection, Unit 2 procedures for implementing postfire safe shutdown capability were incomplete. This item will remain open pending further verification by Region III.

- w. (Closed) Open Item (455/83-42-19(DRS)): Adequacy of Unit 2 proposed operating fire protection technical specifications.

This item is closed based on the licensee's corrective actions taken for Unit 1 fire protection technical specifications. This concern was closed for Unit 1 in Region III Inspection Report No. 454/84-60(DRS).

- x. (Open) Open Item (455/83-42-19(DRS)): Adequacy of Technical Specifications surveillance procedures.

At the time of this inspection, development of Unit 2 fire protection technical specification surveillance procedures was incomplete. This item will remain open pending further verification by Region III.

- y. (Open) Unresolved Item (455/83-42-20(DRS)): Concerns regarding the separations of redundant trains.

At the time of this inspection, Unit 2 construction activities were ongoing. Measures taken to separate redundant trains were incomplete. This item will remain open pending further verification by Region III.

No violations or deviations were identified.

3. Administrative Controls

a. Control of Welding and Cutting Activities

Section 2.c(6) of Facility Operating Licensee No. NPF-23 for Byron Unit 1 requires that the licensee maintain in effect all provisions of the approved fire protection program as described in the Byron Fire Protection Report through Amendment No. 5. Administrative controls are required to be established for Operating Unit 1 and to protect Unit 1 from the construction fire hazards of Unit 2 by Sections 3.A.8 and 3.2.3(a) of the Byron Fire Protection Report. Sections 3.2.B.3.(a) and Section III.K.5 of Appendix A.5.7 of the Byron Fire Protection Report require that administrative controls be established to control work involving ignition sources such as welding and cutting activities. Furthermore, by letter dated June 14, 1985 (D. L. Farrar-CECo to H. R. Denton-NRC), the licensee committed to comply with the requirements of National Fire Protection Association Standard No. 51B regarding welding, cutting and grinding activities.

The following observations made in this area:

(1) Welding/Grinding With No Fire Watch

During a tour of the Auxiliary Building on November 10, 1985, the inspector observed a welding and grinding operation in progress by two workers in the vicinity of the radwaste remote shutdown panel on the 383 foot elevation. Both workers were facing opposite each other. One worker was welding while the other was grinding. No one was performing fire watch duty. There were combustibles (plastic pail of wood scraps) within ten feet of the welding and grinding operation.

When questioned about a required fire watch for the operation by the inspector, each worker claimed to be the fire watch for the other. When asked for a welding and cutting permit, the workers could not locate one, but claimed that such a permit

had been issued and left inside of another work package. After stopping work and leaving the area, the workers returned with a welding permit some time later and one worker resumed the welding/grinding activity while the other worker performed the required fire watch duty.

Although the worker performing fire watch duty produced evidence that he had received fire watch training, he did not appear to be fully cognizant of the required duties of a fire watch because he failed to remain in the area while the welding/grinding work was being performed. In addition, to perform the fire watch duty, he positioned himself in a position that isolated him from the fire extinguisher provided to combat fire and, he failed to notice the plastic five-gallon pail of wood scraps within ten feet of the welding/grinding operation.

Further review of this situation revealed the following:

(2) Shift Engineer Authorization of Welding Permits

The shift engineer's office had no knowledge of welding/grinding activities being conducted in this area because the licensee's procedure governing these activities appears to be inadequate and allow excessive latitude to contractors to perform such work without the licensee's knowledge or control.

Nuclear Work Request No. 6B1007, issued in May, 1985, authorized this work to be performed in Units 1 and 2. The fire hazard analysis review for the work request indicated that welding is to be performed by procedure. Unit 1 Operations Procedure No. BMP 3101-5 and Unit 2 Construction Procedure No. B.S.I. 104-5 require shift engineer authorization on welding and cutting activities only if this work is to be performed in ten designated areas. The licensee's rationale for limiting shift engineer authorization of these activities to these areas was based on a reduction of shift engineer workload.

Where the shift engineer is required to authorize welding and cutting activities, on the spot authorization is given in the shift engineer's office. No inspection of the areas is performed to authorize the work to begin, and no subsequent monitoring of the activity is done by the shift engineer.

(3) Contractor Supervisor Authorization of Welding Permits

Both Unit 1 and 2 welding and cutting procedures direct contractor supervisors to obtain shift engineer authorization for work to be performed in the ten designated areas identified in the procedures. The procedures direct contractor supervisory personnel to authorize welding and cutting

activities and issue welding and cutting permits in other safety-related areas of the plant without shift engineer authorization. According to the licensee, the shift engineer could track welding and cutting activities through associated Nuclear Work Requests that are maintained in the shift engineer's office, but no procedure is established to require this action.

(4) Fire Watch Requirement and Permit System Limitation

The procedures for both Unit 1 and Unit 2 employ a methodology which limits the application of the requirement for fire watches and welding permits when welding and cutting activities are performed. According to the procedures, in areas where there are significant transient combustibles, a contractor fire watch is required to be present during welding/cutting but a welding and cutting permit is not required. In areas where it is assumed that only minor fires might occur, no welding permit and no fire watch is required.

In response to these limitations the licensee provided the inspector with documentation indication that supervision has received additional training on welding and cutting procedures. The licensee also indicated to the inspector that a complete review of the procedures would be performed and appropriate changes made to properly govern work involving ignition sources under closely controlled conditions.

Items 1, 2, 3 and 4 are considered an unresolved item (454/85049-01; 455/85034-01(DRS)) that may result in enforcement action pending Region III review and acceptance of the licensee's written response describing corrective actions taken.

b. Control of Combustibles

At approximately 1630 hours on January 14, 1984, the licensee reported that a fire occurred on the Unit 1 Auxiliary Building roof. The cause of the fire was determined to be the result of non-fire-retardant wood scaffolding in contact with the 1A diesel generator exhaust piping. There was no damage to structures or components required for safe operation of the plant.

Fighting the fire and removal of the wood scaffolding was complicated by the fact that the 1A diesel generator continued to run, causing the auxiliary building roof concrete penthouse structure housing the 1A diesel generator exhaust stack to be filled with hot exhaust gases, heat, and smoke from the fire. In addition, the 100 feet of fire hose at hose station No. 1 (auxiliary building elevation 471 feet, column-row L-10) was insufficient to reach the fire, and fire brigade portable radio and telephone communications were lost at the time of the fire due to a planned outage on Communications Bus No. 033W.

The results of the inspector's review of this event are as follows:

(1) Use of Fire Retardant Wood

According to the licensee's January 7, 1985 internal correspondence (G. Sorenson to J. Oster), in 1976 or 1977, the licensee decided to take an insurance penalty for wood which was not fire retardant. Subsequent to that decision, the licensee committed to meet the requirements of Appendix R to 10 CFR 50 for Unit 1. An October 17, 1984 internal correspondence (M. E. Lohmann to all site contractors) was issued indicating that all wood in the Unit 1 Reactor Building was to be replaced with appropriate fire retardant wood. An April 8, 1985, internal correspondence (G. Sorenson to J. Oster) indicated that all wood in Unit 2 was replaced with fire-retardant wood.

During plant tours, the inspector verified on a sample basis the presence of fire retardant wood labelled "NCX Blue" in both Unit 1 and Unit 2. The temporary wood foundation for rail car tracks on the Unit 2 refueling floor is not fire retardant wood. However, this exception was granted to the licensee by NRR in the safety evaluation report for Condition No. 25 of Special Nuclear Materials License No. SNM 1917.

(2) Fire Brigade Communications

Communications Bus No. 033W has been modified and power is now supplied by the security diesel generator. In the event of a loss of offsite power (such as the planned bus outage at the time of the January 14, 1984 auxiliary building roof fire), a continuous onsite power supply is provided for portable radio repeaters and telephone communications.

(3) Fire Hose Length

In response to the concern for the adequacy of hose lengths at hose station No. 1, the license revised prefire plans to require the fire brigade to respond to a fire in this area with extra hose lengths. This was determined acceptable.

No violations or deviations were identified.

4. Building Design

a. Fire Hose Stations

On a sample basis the inspector evaluated the licensee's fire hose station installations for conformance with NFPA Standard No. 14 as committed to by the licensee in Section 3.6.c(4) of the Byron Fire Protection Report. A proposed change from the hose station at column-row K-14 to column-row K-17 could not be validated by NRR

according to the Byron/Braidwood Fire Protection Report (Diagram No. M-52, Sheet 11). This change is generic to both Byron and Braidwood and is also discussed in Region III Inspection Report No. 456/85-053; 457/84-51 for Braidwood Units 1 and 2.

The hose station for column-row K-17 at elevation 451 feet of the turbine building is located in an inaccessible location inside the electrical instrumentation lab in the auxiliary building. Over 300 feet exists between hose stations located at column-row J-12 and column-row L-26 on the south wall at elevation 451 feet of the turbine building. This is inconsistent with NFPA 14 as these hose stations are used to facilitate manual fire-fighting in safety-related areas of the auxiliary building.

To correct this condition, the licensee proposed to relocate the hose station for column-row K-17 to the corridor outside of the auxiliary electric equipment room so as to facilitate manual fire-fighting activities in the Unit 2 control room area. By the conclusion of the inspection, no decision was made on the installation of a hose station at column-row K-17. The licensee stated that further reviews would be conducted to determine the feasibility of bringing this installation in conformance with NFPA Standard No. 14.

This is considered an Open Item (455/84034-02(DRS)) pending verification by Region III.

b. Fire Barrier Penetration Seal Installations

Fire barrier penetration openings are required by Section 3.4.d.3(d) of the Byron Fire Protection Report to be sealed to give protection of the opening that is at least equivalent to that of the fire barrier. The licensee's firecode CT Gypsum fire barrier penetration sealing material is an acceptable material if properly applied. The NRC raised concerns at LaSalle Station over the application of firecode CT Gypsum fire barrier penetration sealing material. The licensee has satisfactorily resolved most of these concerns. The following concerns have not been resolved:

(1) Depth of Penetration Opening

To achieve the qualified three-hour fire rating, the Gypsum material must be applied to a depth of five inches, in combination with four inches of thermafiber CT felt. Where there are thin floors or walls less than nine inches thick, the licensee has not identified or verified the acceptability of these installations.

(2) Large Configurations

Where the Gypsum fire barrier penetration sealing material is applied in large configurations that exceed the dimensions of the configurations qualified by fire tests (i.e., control room floor penetrations), the licensee has not identified or verified the acceptability of these installations.

(3) Cable Density

Fire tests qualifying the Gypsum material as a three-hour rated fire barrier limit cable density (area filled by cables) to 40 percent of the penetration opening. The licensee has not verified conformance of cable density to the qualifying fire test criteria.

This (items 1, 2 and 3) is considered an Open Item (454/85049-02; 455/85034-03) pending verification by Region III.

No violations or deviations were identified.

5. Fire Protection Program Implementation

The inspector reviewed the licensee's implementation of the fire protection program for Unit 2 prior to initial fuel loading as required by Section 3.1.e(2) of the Byron Fire Protection Report. Preoperational testing is required to be conducted of new fire protection equipment to verify operational readiness and conformance with design requirements. Tests are required to be performed in accordance with written test procedures, and test results are required to be reviewed and evaluated in accordance with appropriate acceptance criteria.

The following are the results of the inspector's review:

a. Preoperational Test Procedures

A selected sample of Unit 2 station approved preoperational test procedures were reviewed. All tests reviewed incorporated appropriate procedural steps to measure quality affecting parameters that demonstrate operability of the equipment in accordance with design and governing code requirements.

b. Preoperational Test Results

Preoperational testing of fire protection systems was incomplete at the time of the inspection. Complete review of the test results will be made during subsequent Region III inspection.

c. Unqualified Sectional Isolation Valves Installed in the Fire Protection Water Supply System

Region III Inspection Report No. 456/85-053(DRS); 457/85-051(DRS) for Braidwood documents an NRC concern about unqualified sectional isolation valves installed in the Reactor Building Fire Protection Water Supply System. These valves are manufactured by various fire protection equipment vendors and are installed in the fire protection water supply system in accordance with seismic requirements. Underwriters Laboratories Inc. does not list or label seismic class materials. Therefore, these valves do not have the required formal fire resistive qualification. This is inconsistent with the licensee's commitment in Section 3.6.b(1) of the Byron Fire Protection Report to install the fire protection water supply system in conformance to NFPA Standard No. 24. This is a generic concern for the Byron and Braidwood facilities.

To resolve this concern, the licensee is requested to verify the acceptability of these valve installations and identify deviations from NFPA Standard No. 24 to NRR.

This is considered an Unresolved Item (454/85049-03; 455/85034-04 (DRS)) pending verification by Region III.

No violations or deviations were identified.

8. Open Items

Open items are matters which have been discussed with the licensee, which will be reviewed further by the inspector, and which involve some action on the part of the NRC of licensee or both. Open items disclosed during the inspection are discussed in Paragraphs 4.a and 4.b.

9. 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 3.a and 5.c.

10. Exit Interview

The inspectors met with the licensee representatives at the conclusion of the inspection on December 12, 1985, and summarized the scope and findings of the inspection. The licensee acknowledged the statements made by the inspectors. The inspectors also discussed the likely informational content of the inspection report with regard to documents reviewed by the inspector during the inspection. The licensee did not identify any such documents as proprietary. On January 10, 1986, in a telephone conversation with the licensee, additional concerns regarding the adequacy of administrative controls over welding and cutting activities were discussed with the licensee.