

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Reports No. 50-456/88010(DRS); 50-457/88011(DRS)

Docket Nos. 50-456; 50-457

Licenses No. NPF-72; NPF-75

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

Facility Name: Braidwood Station, Units 1 and 2

Inspection At: Braidwood Site, Braidwood, Illinois

Inspection Conducted: March 14 through March 30, 1988

Inspector: *Ronald N. Gardner for*  
Jeff Holmes

4/20/88  
Date

Approved By: *Ronald N. Gardner*  
Ronald N. Gardner, Chief  
Plant Systems Section

4/20/88  
Date

Inspection Summary:

Inspection on March 14 through March 30 (Reports No. 50-456/88010(DRS);  
No. 50-457/88011(DRS))

Areas Inspected: Routine announced inspection conducted to review the status of fire protection license conditions and open items. The following inspection modules were employed by the inspector: 64704 and 92701.

Results: Of the areas inspected, no violations or deviations were identified.

## DETAILS

### 1. Persons Contacted

#### Commonwealth Edison Company (CECo)

K. Kofron, Production Superintendent  
P. Earnes, Regulatory Assurance Supervisor  
E. Carroll, Regulatory Assurance  
W. McCue, Operations Engineer

#### U. S. Nuclear Regulatory Commission (NRC)

T. Tongue, Senior Resident Inspector

### 2. Licensee Action on Previously Identified Items

#### a. License Condition

In Attachment 1 to low power License No. NPF-75, the licensee was required to complete certain fire protection program work activities and provide compensatory measures. These requirements were identified in the December 16, 1987 letter from S. Hunsader (CECo) to T. Murley (NRR). Discussed below are the licensee's actions regarding the license condition.

#### (1) Structural Steel

In the December 16, 1987, letter, the licensee provided a list of areas where work was not completed in protecting the structural steel by applying fire resistive material. The inspector toured several areas and visually observed that the fire resistive material was installed as required by Sargent and Lundy (S&L) drawings. Based on discussions with the licensee, review of the S&L drawings and visual observation of the installed fire resistive material on the structural steel, it was determined that the requirement of the license condition had been completed.

The inspector questioned the licensee on the methodology of identifying which structural steel components were required to be protected. For example, S&L drawing A-819, auxiliary building mezzanine floor EL 426, identifies where structural steel is required to be protected. It was not clear to the inspector why the S&L drawings did not require the columns at coordinates 17, 18, and 19 between V and W to be protected.

The inspector observed on elevation 401 that structural steel column P-21 had several unprotected auxiliary steel attachments. The licensee was requested to provide technical justification that the column P-21 fire resistive rating has not been degraded by the numerous attachments of auxiliary steel.

The inspectors concern regarding the methodology of identifying structural steel components to be protected and the technical justification that column P-21 will meet or exceed it's fire resistive rating is considered an open item (456/88010-01; 457/88011-01) pending review of licensee response.

(2) Cable Tray and Conduit Fire Wrap

Also, in the December 16, 1987, letter, the licensee listed the cable trays and conduits that required fire wrap. The inspector toured several areas where the cable tray and conduit fire wrap had been installed as required by the license condition. Based on the inspector's visual observation of the completed fire wrap and discussions with the license, it was determined that the license condition had been completed.

On elevation 364, curved wall area (Pipe Penetration Area), the inspector questioned the as built 3M fire barrier. The licensee indicated to the inspector that the fire wrap provided was an unusual configuration due to it's location and that it was determined at the time of installation to be adequate. The inspector requested justification that the installed cable fire wrap was adequate (Refer to the discussion regarding Open Item 457/86033-03 discussed later in this report).

- b. (Open) Open Item (457/86033-01): During the Appendix R walkdown of Unit 1 procedure PRI-5 entitled "Control Room Inaccessibility," it was identified that the access to valves and other components was extremely difficult due to numerous obstructions. In addition, it was recommended that the licensee take corrective action to reduce the probability of head injury to an individual in transit to the safe shutdown panel.

In a letter dated March 29, 1988, to G. Master from R. Anderson, the licensee indicated that Braidwood Operating Department personnel performed a physical walkdown of PRI-5 for Unit 2. The letter also indicated that several valves which were required by the procedure to be manipulated were accessible by climbing pipes in the area and that climbing was not excessive and no further actions to improve accessibility were deemed necessary. Finally, the letter indicated that components required to achieve and maintain hot standby conditions were accessible.

During this inspection, the inspector walked down several safe shutdown routes for hot shutdown utilizing procedure PRI-5. The inspector observed that in the areas toured the equipment was accessible. This portion of the item will remain open pending further review of any additional gallery work in containment and walkdown of PRI-5 for accessibility to cold shutdown equipment.

° Emergency Lighting for Safe Shutdown Equipment

This item was also associated with the installation and testing of the emergency lighting required for safe shutdown.

The inspector toured several areas that required emergency lighting for operation of safe shutdown equipment and in access and egress routes thereto. The inspector observed in some areas that the lighting was not directed at the pathway or equipment it was expected to illuminate. The licensee indicated to the inspector that within two weeks the lights would be oriented in their proper position. The inspector informed the licensee that the licensee should verify by field testing (Blackout) that the lighting was adequate to perform its intended task. The licensee indicated that a partial blackout test would be conducted and where it was readily observable that lighting was available justification would be provided instead of the blackout test.

This portion of the item will remain open pending review of the licensee's actions regarding emergency lighting.

The inspector informed the licensee that equipment utilized for Appendix "R" could be easily identified with use of reflective tags and that the licensee should consider incorporating emergency lighting routes in the operator training of PRI-5.

° Essential Lights

During the walkdown, the inspector requested that the lights be switched-off in the ESF switch gear room (Bus 242 Div 22) and remote shutdown panel. In both these areas, all lights were connected to a wall switch. The inspector indicated to the licensee that if essential lighting is required in the area, that it should be provided. This is considered an unresolved item (456/88010-02; 457/88011-02) and will be reviewed during a future inspection by a Region III electrical specialist.

- c. (Open) Open Item (457/86033-02): The licensee was requested to provide an analysis that ensured that communication is available when control room inaccessibility procedure PRI-5 is utilized during a fire and loss of off-site power.

The licensee has several forms of communication consisting of public address system, telephones, portable radios and sound powered phones. The licensee indicated to the inspector that the telephone and portable radio repeaters are connected to the auxiliary diesel which would provide power should a loss of offsite power occur. The public address system is connected to the 1B diesel generator which would provide power in the event of a loss of offsite power. The sound powered phones obtain it's power from operator generated sound

and requires no additional energy source. The licensee indicated to the inspector that in the unlikely event that a disabling fire occurred and required an evacuation of the control room, the portable radios (and radio repeaters) are expected to be available for communication.

The licensee provided the inspector with a letter dated March 22, 1988, from E. Crass, S&L, to L. Stern, CECO which indicated that a fire in the control room would not prevent the diesel generator from starting, nor supplying power to its MCC and the connected loads. The station auxiliary diesel MCC does supply some loads in the control room, but those circuits are protected by breakers or fuses such that a fault in one of those circuits would not propagate and disable the auxiliary diesel MCC bus (breaker coordinated).

In a telephone conversation on April 13, 1988, the licensee indicated to the inspector that high impedance fault analysis for the auxiliary diesel was not available. The licensee was requested to consider the effects of high impedance faults on the security diesel and demonstrate that communication (portable radio and repeaters) would be available for a disabling fire requiring the evacuation of the control room. This item will remain open pending review of licensee's response.

During this inspection, the inspector requested a communication test between the remote shutdown panel and several areas utilized for hot shutdown outside the control room. During this test, the only form of communication utilized was the portable radios.

The licensee indicated to the inspector that the director of operations would be utilizing a hand held portable radio. It was recommended to the licensee that a radio console with foot pedals be installed for the director of operations. Communication in the areas tested was adequate.

- d. (Open) Open Item (457/86033-03): The fire wraps required to protect a redundant train from a fire were not installed. The completion of the fire wrap were made part of low power license No. NPF-75. During this inspection, the inspector sampled several areas and observed that the fire wrap was installed as required by the license condition.

On elevation 364, 23 Y to W (curved wall - Pipe Penetration Area), the inspector observed an installation that did not appear to be covered by the manufacturer's instructions. The licensee was requested to provide the technical justification as to why the as installed fire wrap was adequate.

In addition, the licensee provided the inspector with instructions as to how 3M material is to interface with non-3M fire barrier material. The licensee was requested to provide the technical justification of the adequacy of this type of interface installation.

This item will remain open pending review and acceptance of the licensee's analysis or technical justification regarding the fire wrap that was not covered by the manufacturer's instructions and the 3M interface with non-3M material.

- e. (Open) Open Item (457/86033-06): The staff required that sprinkler heads be repositioned and/or added to provide adequate protection from an exposure fire. The Auxiliary Building stairway near column P-18 between elevation 401 and 426 is protected by a sprinkler system using the sprinkler draft curtain method. However, due to the large obstruction underneath the sprinklers, it was not clear how the sprinklers were expected to operate and provide the desired protection. The licensee indicated to the inspector that their consultants reviewed the sprinkler system arrangement and found it acceptable.

The inspector requested that the licensee review this portion of the sprinkler system and provide the level of fire protection that was observed on the other levels of the stairwell utilizing the sprinkler draft curtain method.

This will remain an open item pending review of the licensee's actions.

In the Unit 2 pipe penetration area elevation 364, fire zone 11.3-1, the inspector observed a sprinkler system that deviated from NFPA with respect to the location of the sprinkler deflector and the height of the ceiling.

In the Byron/Braidwood Station Fire Protection Report, Braidwood deviation No. A.13 for the pipe penetration area (fire zone 11.3-1) states "as requested by the staff the sprinker system design deviates from NFPA Code 13, article 4-3 regarding the position of sprinklers."

The inspector requested that the deviation of NFPA-13 be included in the licensee's NFPA code review.

In addition, to further strengthen the fire protection in the area, the inspector requested and the licensee agreed to red line the floor and keep combustibles out of the Pipe Penetration Area underneath the protected redundant division of safe shutdown cabling.

- f. (Closed) Open Item (456/86045-10; 457/86033-10): The licensee provided an oil collection system for the reactor coolant pumps, however, it was identified by the inspector that a portion of the high pressure screwed connection on the discharge side of the oil lift pump did not appear adequately protected to contain an oil release.

The licensee indicated to the inspector that covers were provided for all the reactor coolant pump oil collection systems that enclosed the oil lift pump and the high pressure screwed connection. The licensee also provided the inspector with construction work record RC-51-0214 which indicated work was completed on January 12, 1988.

Based on licensee's statements and the construction work record this item is considered closed.

- g. (Closed) Open Item (456/87027-02): At elevation 364 of the auxiliary building, the licensee was required to protect one division of the charging pump cables (COA 2594) by a three-hour fire rated cable wrap. The inspector observed that one division of the charging pump cables was protected by a three hour wrap up to the 383 level; however, several inches away there was a 12 inch opening (1AI112) which exposed the charging pump cable (COA 2594).

During the inspection conducted June 10 through August 21, 1987, the inspector discussed protecting charging pump cable COA 2594 from an exposing fire on elevation 364 of the Auxiliary Building by protecting the opening on elevation 383. The licensee acknowledged the inspector's concern and indicated that the concern would be reviewed.

During this inspection the licensee provided the inspector with a letter dated November 10, 1987 from E. Crass, S&L, to M. Pietraszewski, CECO. The letter presented a brief history of the safe shutdown separation issue at the Byron/Braidwood Stations. The letter indicated that resolution of the safe shutdown separation issue was obtained after many months of negotiation between CECO and the NRC staff. The letter further described the resolution concerning separation of redundant safe shutdown equipment and cabling as presented below.

For the general areas of the auxiliary building, CECO agreed to protect redundant safe shutdown equipment and cables within any one fire zone as follows:

- ° Three hour fire barrier
- ° One hour rated barrier and fixed suppression
- ° By combination of features as discussed in specific Appendix "R" deviations

In fire zones where a three hour fire wrap was used, the licensee agreed to apply the wrap throughout the fire zone in question (i.e. "wall-to-wall and floor-to-ceiling") and seal penetrations at each end. Where cables from two different divisions on two adjacent elevations existed, a review of the horizontal separation between

the unprotected redundant components and cables on the two elevations was considered. If the horizontal separation was less than 20 feet between redundant equipment or cabling, then the floor in the immediate area was upgraded to be equivalent to a rated fire barrier.

For each zone in question an Appendix R deviation has been identified. Justification was based on low combustible material inventory and automatic detection throughout the areas. The acceptability of the design was presented in NUREG 0876, dated October 1985 (Byron SER), Section 9.5.1.4. The letter indicated that based on the previous comments and the fact that the other Division cables were located a horizontal distance of more than 40 feet no further action was required.

The inspector informed the licensee of the potential weakness in the opening on the 383 level that may expose redundant cabling as previously identified in this open item. Based on NUREG 0876 dated October 1984 and the licensee response, this item is considered closed.

3. 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 or licensee or both.

4. Unresolved Items

Unresolved Items are matters about which more information is required in order to ascertain whether they are acceptable items, violations, or deviations.

5. Exit Interview

The inspector met with the licensee representative at the conclusion of the inspection on March 30, 1988. The inspector discussed the likely content of this report and the licensee did not indicate that any information discussed during the inspection could be considered proprietary in nature.