

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Reports No. 50-456/93022(DRS); 50-457/93022(DRS)

Docket Nos. 50-456; 50-457

Licenses No. NPF-72; NPF-77

Licensee: Commonwealth Edison Company
Opus West III
1400 Opus Place
Downers Grove, IL 60515

Facility Name: Braidwood Station, Units 1 and 2

Inspection At: Braidwood Site, Braidwood, Illinois

Inspection Conducted: December 13 - 27, 1993

Inspector: W D Shafer for
D. L. Schrum

1-19-94
Date

Approved By: W D Shafer
W. D. Shafer, Chief
Maintenance and Outage Section

1-19-94
Date

Inspection Summary

Inspection from December 13 - 27, 1993 (Reports No. 50-456/93022(DRS)); 50-457/93022(DRS))

Areas Inspected: Routine, unannounced fire protection inspection of surveillances, equipment, impairments, control of combustibles, fire brigade training and drills, and fire protection audits. The inspector utilized selected portions of NRC inspection procedures 64704 and 92702.

Results: Overall, fire protection activities were adequately implemented in meeting the safety objectives of the program. The main program strength was fire prevention which included control of combustibles, control of oil leaks, housekeeping, and cleanliness of the plant. A violation of NRC requirements was identified with the timeliness of corrective actions for a blocked open fire door (paragraph 3.2) and failure to identify and take corrective actions for a high failure rate of emergency lighting during surveillances (paragraph 3.4). Issues included an isolated concern identified regarding anti-contamination clothing being stored below a cable tray which contained safety related cables, the timeliness of corrective actions for impairments, and the use of the essential service water system as a backup fire protection suppression water supply.

DETAILS

I. Persons Contacted

Commonwealth Edison Company (CECo)

- *D. Cooper, Operations Manager
- *B. Boyle, Assistant Fire Marshal
- *J. Gosnell, System Engineer
 - D. Christiana, Engineering Programs Lead
- *A. Haeger, Regulatory Assurance Supervisor
- *G. Kinsella, Fire Marshall
 - R. Kerr, Engineering and Construction Manager
- *T. Kirman, Electrical Maintenance Staff Supervisor
- *F. Lesage, Site Quality Verification
- *J. Lewand, Regulatory Assurance
- *D. Miller, Technical Services Superintendent
- *K. Radke, Fire Protection System Engineer
 - M. Togliette, Regulatory Assurance

*Denotes those attending the exit interview conducted on December 27, 1993.

The inspectors also interviewed several other licensee employees.

2. Licensee Action on Previously Identified Items(92702)

(Closed) Followup Item 456/457/93016-02(DRP): This NRC inspection followup item pertained to the turbine building fire protection header pressure while cross-tied to essential service water. The concerns for this item will be tracked by followup item 456/457/93022-02(DRS). Those concerns are listed in paragraph 3.3.

3. Routine Fire Protection Program Review (64704)

This inspection consisted of observations of plant areas and reviews of fire protection surveillances, maintenance on fire protection equipment, fire brigade training and drills, fire reports, deviation reports, work requests, safety evaluations, controls to prevent bio-fouling by zebra mussels, and audits of fire protection activities.

3.1 Observation of Plant Areas

The inspector toured the areas of the auxiliary and turbine buildings and the screen house to observe the adequacy and control of combustibles, fire doors, hose stations, detection equipment, extinguishers, sprinkler systems, emergency lights, and housekeeping.

The material condition of the fire suppression and detection equipment was good. The diesel fire pump appeared to be in good condition during the walkdown. Fire brigade equipment was in good shape and was stored in locked cages in convenient locations in the plant.

The cleanliness and housekeeping in the plant was excellent, except for the screen house. The resident inspector indicated that this area was normally in excellent condition, but with the circulation water pump, service water pump, and electric fire pump maintenance work in progress, this area had degraded.

The control of normal combustibles was good with very few transient combustibles in the plant. Storage cages in the plant contained a limited amount of combustibles. Flammable liquids were stored in fire proof cabinets and in appropriate safety cans. Equipment in the plant had few oil leaks. One area of concern was that a large amount of anti-contamination clothing was stored below a cable tray in the Auxiliary Building. The fire marshall indicated that this had been a previous NRC concern and that plastic storage bins had been replaced by metal storage bins, but all of the storage bins were uncovered, still representing a significant threat to the cable trays, which contain safety related cables. This condition is contrary to Branch Technical Position 9.5.1., because no automatic fire suppression system is provided for the cable trays with combustibles being stored nearby. The licensee filled out a problem identification form (PIF) to evaluate this condition.

Most fire doors in the plant were in good condition. Only a few of the doors did not latch when they self-closed. Some fire doors were not marked on both sides of the door potentially resulting in plant staff not being alerted to the fact that a fire door had been inadvertently blocked open. Impaired doors were being tracked by the fire protection personnel. An impaired fire door condition that existed for almost three years is described in paragraph 3.2.

3.2 Fire Doors

The licensee did not take timely corrective actions for an impaired fire door between the auxiliary building and the turbine building. The door is a rated fire protection barrier between safety and non-safety related areas of the plant. The site had experienced exhaust and intake air fan problems in the auxiliary building which resulted in air pressure imbalances. When problems were experienced with the fans, it resulted in a high differential pressure between the turbine building and the auxiliary building causing the doors between the auxiliary and turbine building to slam excessively and be damaged.

The plant staff blocked the door open to allow air to flow between the two areas to partially equalize the air pressure. The fire door had been blocked open since March 1991 with no corrective action for the fire protection problem. During this time, no assessment was made to modify the fire door or to ensure that the ventilation problems were adequately resolved. The plant staff stated that since the ventilation

system never was completely fixed, no corrective actions for this condition was pursued. The licensee allowed this impairment to exist for almost three years. The failure to promptly correct conditions adverse to quality is a violation of 10 CFR 50, Appendix B, Criterion XVI(456/457/93022-01a(DRS)).

3.3 Diesel and Electric Fire Pumps

During July 1993, the diesel and electric fire pumps became inoperable and the plant had to cross-tie to the ESW system to supply water to the fire main system. The ESW system is a lower pressure system than the normal water supply to the fire main system. The resident inspector expressed a concern with the pressure in inspection report 93016 in July 1993. During the inspection when asked for the sprinkler system calculations, the licensee indicated that the data was not available. Corporate staff performed preliminary calculations during the inspection and indicated that two sprinklers in the plant did not meet their flow requirements as a result of the lower pressure in the ESW system. The licensee stated that final calculations would not be available until January 1994.

Procedure BwAP 1110-1 requires that a continuous fire watch be assigned for those areas with inoperable sprinklers. These actions were not performed. During the exit, the licensee management stated that actions had been taken to ensure that continuous fire watches would be posted for the two areas without adequate sprinkler flow if the ESW system is required for fire protection. On January 5, 1994, the licensee indicated by telephone that they had found the appropriate calculations which showed that all sprinklers in the plant meet their flow requirements.

An additional concern was that documentation exists for the operators to open valves to cross-tie the ESW system to the fire main system, but when the licensee was asked for documentation for taking actions to isolate the electrical transformer deluge systems to prevent inadvertent actuations of those systems. They stated that operations takes these actions but it had not been proceduralized. Also, the licensee's analysis to use the ESW system only took into account 150 gallons of flow for two fire hoses but did not account for the water used for the sprinklers during a worst case fire. The licensee, after the end of the inspection, found the analysis which demonstrated that an adequate flow exists for normal cooling needs performed by the ESW system with 1100 gpm being used by the sprinkler systems.

The plant staff stated that a low friction straight stream nozzle and a larger diameter hose would be used to ensure that adequate flow was available from the fire hoses during a fire, but it was determined during the inspection that a larger diameter hose was not available to the fire brigade. Also, the plant had not assessed whether adequate flow would be available if fog nozzles needed to be used for an electrical fire. The licensee could not be certain that the flow would be adequate to protect the fire brigade from the fire or whether the

fire brigade would be at risk from electrocution with the use of a straight stream nozzles. The above listed concerns will be tracked by followup item (456/457/93022-02(DRS)).

A licensee site team investigated the problems with the fire pumps during July 1993 and assigned an action item to consider adding another fire pump to the fire system.

3.4 Surveillances

The emergency lighting surveillances were reviewed for completeness, accuracy, procedure compliance, and availability. The surveillances were performed on time, complete, accurate and procedure compliance was good; however, the material condition of the emergency lights was poor. Emergency lighting surveillances, which include the Appendix R safe-shutdown emergency lights, were performed on a eighteen month cycle. The plant groups the surveillances by: Unit 1, Unit 2, and the common areas and then subdivided the surveillances so they were spread over the 18 month surveillance cycle. A review of surveillances indicated a high failure rate. The corrective actions taken for conditions that contributed to the high failure rate were: battery replacement, cutoff voltage adjustments, burned out bulb replacement, replacement of charging and switching boards, aiming holddown J-hook replacement, cleaning terminals, replacing blown fuses, and adding water. The surveillances indicated that the failure rate for Unit 2 emergency lighting was particularly high. Approximately one-fourth of the batteries required replacement. The licensee replaced the batteries, but failed to identify the numerous failures as condition needing a prompt evaluation for root cause. The failure to promptly identify and take actions to correct conditions adverse to quality is a violation of 10 CFR 50, Appendix B, Criterion XVI(456/457/93022-01b(DRS)).

The inspector observed a surveillance being performed on fire detectors. The staff appeared knowledgeable of their task and was performing the work in a professional manner. The licensee had placed marking spots on the floor in several areas of the plant, such as the cable spreading areas, to more readily locate fire detectors.

3.5 Fire Watches

Three full time fire watches patrol fixed paths in the Auxiliary and Turbine Buildings. The fire watches appeared to be attentive to their duties during the observation phase of the inspection.

The fire watches do not look at impairments during their rounds of the plant nor do they enter all spaces which have impairments. The plant staff indicated that the fire watches pass by each area on at least one side of the wall opposite of the areas containing the impairments on their hourly rounds. The weakness with this method of inspecting is that if a fire occurred on one side of a fire barrier that by the time a fire is observed by a fire watch it would be on the opposite side of the barrier which may contain the opposite division of equipment. Smoke may

not be present as a result of being removed by the ventilation systems. Also, without specific requirements to visually inspect existing impairments, the licensee has no means to ensure existing impairments are not further degraded. The main advantages of the present method of using fire watches was that most areas of the plant were being monitored on an hourly basis and any presently unknown impairments would be covered by the fire watches.

3.6 Transient and Fixed Combustibles

The plant staff had ensured that the amount of transient combustibles in the plant was low, as indicated during the observation part of the inspection. However, the administrative documents used to control the transient and fixed fire loading in the plant were weak. The staff could not state what actions would be taken for certain amounts of transient combustibles nor what actions would be taken when fixed fire loading exceeds the fire loading allowed. The licensee did not have an adequate explanation on how these documents were used to compensate for these conditions in the plant.

3.7 Impairments

The number of impairments had been reduced during the past year but was considered still high. Many impairments are worked during outages resulting in an increase in number of impairments between outages. The concern is that compensatory measures are in place too long when prompt repairs could solve the problem. For example, when plant staff was asked about two fusible link problems on the impairment list, the plant investigated and determined that they had been replaced during a surveillance. The paperwork that tracks the impairment had not been returned to the fire marshal. The inspector had concerns that the plant staff was not being proactive in reviewing and getting items off of the impairment list and that the accuracy of the impairment list was in question.

3.8 Fire Reports

There were a few insignificant fires during the assessment period and the fire brigade had responded appropriately to the fires. The low number of fires indicated good fire prevention in the plant.

3.9 Zebra Mussels

Zebra mussels were being adequately monitored and represent no threat to the plant at this time. Only one zebra mussel was found on the licensee's test plates.

3.10 Fire Brigade

A review of records indicates that the fire brigade was meeting its quarterly fire brigade training. The records for the fire brigade were being adequately maintained and indicated whether the brigade members

were qualified. The fire brigade critiques for fire drills were thorough and identified both strengths and weaknesses.

3.11 Carbon Dioxide and Halon Suppression Systems

The plant had recently had several inadvertent actuations of carbon dioxide and halon suppression systems. The licensee was still assessing the problems and taking corrective actions to ensure these actuations do not occur again.

3.12 Audits and Field Monitoring Reports(FMRs)

Audit investigations for fire protection were detailed and thorough with adequate staff hours devoted to each audit. The FMRs were performance based observations of conditions in the plant and were effective in identifying problems in the fire protection program. The following audits were reviewed:

- a. Quality Assurance/Nuclear Safety Audit, 20-92-I, 3/4/92
- b. Off-site Quality Verification Audit Report, GO 20-93-I, 3/15/93

4. Inspection Followup Items

Inspection followup items are matters which have been discussed with the licensee, which will be reviewed further by the inspector(s), and which involve some action on the part of the NRC or licensee or both. An inspection followup item disclosed during the inspection is discussed in paragraph 3.3 of this report.

5. Exit Meeting

The inspectors met with the licensee representatives denoted in Paragraph 1 during the inspection period and at the conclusion of the inspection on December 27, 1993. The inspectors summarized the scope and results of the inspection and discussed the likely content of this inspection report. The licensee acknowledged the information and did not indicate that any of the information disclosed during the inspection could be considered proprietary in nature.