

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report Nos. 50-456/88013(DRP); 50-457/88011(DRP)

Docket Nos. 50-456; 50-457

License Nos. NPF-72; NPF-75

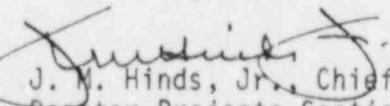
Licensee: Commonwealth Edison Company
Post Office Box 767
Chicago, IL 60690

Facility Name: Braidwood Station, Units 1 and 2

Inspection At: Braidwood Site, Braidwood, Illinois

Inspection Conducted: March 14 through March 25, 1988

Inspectors: T. E. Taylor
T. M. Tongue

Approved By:  J. M. Hinds, Jr., Chief
Reactor Projects Section 1A

4.14.88
Date

Inspection Summary

Inspection from March 14 through March 25, 1988 (Report Nos. 50-456/88011(DRP); 50-457/88013(DRP))

Areas Inspected: Special safety inspection conducted by resident inspectors to evaluate circumstances and significance of events surrounding the inoperability of non-accessible area exhaust filter plenums on December 18, 1987, and on March 13, 1988, for Units 1 and 2.

Results: One violation of NRC requirements was identified: two events involving two inoperable non-accessible area exhaust filter plenums with the subsequent failure to place units in the applicable operating modes as specified in Technical Specification 3.0.3.

DETAILS

1. Persons Contacted

Commonwealth Edison Company (CECo)

*R. E. Querio, Station Manager
K. Kofron, Production Superintendent
D. E. O'Brien, Administrative Superintendent
*G. Masters, Operations Assistant Superintendent
*P. Barnes, Regulatory Assurance Supervisor
*T. Simpkin, Regulatory Assurance
*P. Holland, Regulatory Assurance
J. Kuchenbecker, Shift Control Room Engineer
M. Hess, Nuclear Station Operator
M. Parks, Equipment Attendant

*Denotes those attending the exit interview conducted on March 25, 1988.

2. Purpose

This inspection was conducted to review the circumstances surrounding the inoperability of two non-accessible area exhaust filter plenums. On two occasions (December 18, 1987, and March 13, 1988), while implementing equipment out-of-services (OOSs), the licensee rendered two redundant, independent filter plenum trains inoperable.

3. Description of the Event

The first instance (on December 18, 1987) of non-accessible area exhaust filter plenum inoperability occurred at about 9:13 a.m. when train C was taken out-of-service for a charcoal sample surveillance. Prior to this action, the train B inlet damper was closed as part of the system's normal lineup. A closed train B inlet damper prevents starting the charcoal booster fans for train B. Some of the operations personnel were not aware that having an inlet damper on one train closed and taking another train out of service was contrary to Technical Specification (TS) 3.7.7 requirements. Therefore, at 9:13 a.m., when train C was taken out of service, two trains of the non-accessible area exhaust filter plenums were inoperable. At 11:30 p.m., the error was identified by operations personnel, and the B inlet damper was immediately opened. Technical Specification 3.7.7 allows only one train inoperable for up to seven days. The error was not discovered for about 15 hours, during which time two shift turnovers occurred. The unit common panel, which includes inlet damper position indication, is walked down by the oncoming shift as part of the shift turnover, but the plenum configuration was not identified as an abnormal system lineup.

The second event began on March 13, 1988, at about 2:00 a.m., when seven OOS's for control relays required for an environmental qualification inspection were being implemented. The OOSs required removal of control

fuses for the fuel building and accessible auxiliary building ventilation system relays. The nuclear station operators (NSOs) who determined the OOS boundaries were not aware that removal of these fuses would de-energize control power for the charcoal booster fan outlet dampers and thus would render two non-accessible area exhaust filter plenums inoperable. The OOSs were intended to remove control power only from the fuel handling building and accessible auxiliary building ventilation systems. At about 8:30 a.m., the center desk NSO noticed that the position indication lights for the inlet and outlet dampers for all three trains of the non-accessible area exhaust filter plenum ventilation system were not illuminated. The licensee conducted an investigation, and the initial assessment indicated that all three trains were inoperable. At 9:00 a.m., TS 3.0.3 was entered. At 9:45 a.m. on March 13, 1988, a temporary lift was initiated to restore the control power fuses. When the fuses were installed, the plenums were declared operable, and TS 3.0.3 was exited. A subsequent investigation by the licensee at about 10:00 a.m. identified that train C had been operable for the duration of the event. The inspectors' discussion with the involved NSOs identified that the NSOs were not aware, prior to the event, that removal of the identified fuses would affect the operation of the non-accessible area ventilation system. In accordance with a commitment made in response to the operational readiness inspection, two NSOs are required to determine the OOS boundaries. Non-accessible area exhaust filter plenums A and B were inoperable for about seven hours. The non-illumination of the inlet and outlet damper position indication, which prompted the licensee's investigation at 8:30 a.m., was not identified at the time the OOSs were hung (2:00 a.m.), nor at the shift turnover when the shift engineer, shift control room engineer, and center desk NSO walked down the panels sometime between 6:00 and 7:00 a.m.

These events of December 18, 1987, and March 13, 1988, are collectively considered to be a violation of Technical Specification 3.0.3 (456/87011-01(DRP); 457/87013-01(DRP)).

4. Chronology of Events

- a. 12-18-87 At about 9:00 a.m., Unit 1 was in Mode 1 with the non-accessible area filter plenum exhaust (NAFPE) system in a normal operating lineup with the train A and train C inlet dampers open and the train B inlet damper closed.
- 12-18-87 At about 9:13 a.m., an out-of-service was implemented on train C for charcoal sample analysis while the train B inlet damper remained closed. This exceeds the action statement of TS 3.7.7.
- 12-18-87 By 4:13 p.m., two trains of the NAFPE system had been inoperable for about seven hours, and the licensee had not reduced power to reach Mode 3 (Hot Standby). This is contrary to TS 3.0.3.

- 12-18-87 By 10:13 p.m., two trains of the NAFPE system were still inoperable, and licensee had not reduced Unit 1 to Mode 4. This is also contrary to TS 3.0.3.
- 12-18-87 At 11:30 p.m., the licensee identified that the train B inlet damper was closed with train C inoperable for surveillance activity. The licensee immediately opened the B inlet damper to restore Train B to operable status.
- b. 3-13-88 At 2:00 a.m., the licensee implemented several out-of-services for control power fuse removal on the fuel handling and accessible auxiliary building ventilation systems. This action resulted in lost position indication for the inlet and outlet dampers. The fuse removal also de-energized control power to the charcoal booster fan outlet dampers for trains A and B of the NAFPE system, thereby rendering two trains inoperable. This is contrary to TS 3.7.7.
- 3-13-88 At 8:30 a.m., the Center Desk NSO noticed that the position indication for all inlet and outlet dampers for the NAFPE system were not illuminated. The licensee initiated an investigation of system status.
- 3-13-88 By 9:00 a.m., two trains of the NAFPE system had been inoperable for seven hours, and action had not been taken to reduce Unit 2 to Mode 4. This is contrary to TS 3.0.3.
- 3-13-88 At 9:00 a.m., the licensee entered TS 3.0.3, believing that all trains of the NAFPE system were inoperable.
- 3-13-88 At 9:45 a.m., the licensee implemented temporary lifts to re-install the control power fuses. With the NAFPE system operable, the licensee exited TS 3.0.3.
- 3-13-88 At 10:00 a.m., the licensee discovered that train C of the NAFPE system had been operable for the entire time of the event.

5. Evaluation of the Event

The NAFPE system (two trains required) is manually started during a high radiation condition in the auxiliary building or automatically from a safety injection signal (hi containment pressure, lo pressurizer pressure, low steamline pressure, and manual initiation) from either unit. The inoperable conditions from 2:00 a.m. to 9:45 a.m. on March 13, 1988 and from 9:13 a.m. to 11:30 p.m. on December 18, 1987, reduced the exhaust ventilation capacity of the system to 50%. Two of the system's intended functions are to minimize the release of airborne radioactivity during a high radiation condition in the auxiliary building and to maintain environmental conditions in engineered safety feature areas and cubicles.

During the operational readiness inspection, the NRC identified a concern that the OOS boundaries had not been adequately defined on other occasions. In response to this concern, the licensee committed to having two NSOs determine the OOS boundaries for the March 13, 1988 OOS. Two NSOs were involved; however, the technical requirements were beyond their capabilities.

The significance of these events is that on two separate occasions the licensee initiated actions which rendered two trains of the NAFPE system inoperable and was not aware of the inoperable condition. On both occasions the licensee exceeded the action statement for TS 3.7.7 and was in apparent violation of TS 3.0.3. The plant status at the time of these events, however, considerably reduces their safety significance, as a result of the low source term of each unit.

At the time of the December 18, 1987 (9:13 a.m. to 11:30 p.m.) event, Unit 1 (U-1) was at 88% power. Unit 2 (U-2) was preparing for initial fuel load. During the March 13, 1988 event (2:00 a.m. to 9:45 a.m.), U-1 was in Mode 4 (Hot Shutdown) with reactor coolant system (RCS) pressure at 375 psi and RCS temperature at 340°F. U-2 was in Mode 3 (Hot Standby) at normal operating pressure and temperature (pressure 2235 psi, temperature 557°F). U-2 had attained initial criticality on March 8, 1988, and was conducting low power physics testing.

6. Corrective Action Initiated by the Licensee

- a. For the December 18, 1987 event, the licensee, upon realizing the incorrect system configuration, immediately opened the closed train B inlet damper. LERs 87-063-00 and 87-063-01 were issued to address this event; the stated corrective actions include: (1) training of Station Control Room Engineers with regard to the basis for the supplementary guidance relative to the subject Technical Specification and a review of similar events experienced at Byron Station; and (2) inclusion of this event in the Licensed Operator Requalification Program. Also, a Technical Specification Interpretation was issued to clarify what constitutes an operable filter plenum train.
- b. For the March 13, 1988 event, the licensee's immediate action was to initiate a temporary lift to restore power to the charcoal booster fan outlet dampers to restore NAFPE system operability. This event will be addressed in the forthcoming LER 88-006. This event will also be addressed by the licensee's Potentially Significant Event (PSE) program, which identifies corrective actions and recommendations. For this event, the identified corrective actions are: (1) that the event will be brought to the attention of all licensed personnel, with emphasis on close review of uncommon multiple identical OOSs with electrical isolation points to ensure that license requirements are not downgraded; and (2) that upon review of the final report, station management will initiate or modify proposed corrective action.

7. Conclusion

These events indicate a weakness in the licensee's implementation of the OOS process and Technical Specification application. The root cause of the December 18, 1987 event was an operator taking a system train out of service without proper knowledge of the required system configuration. The March 13, 1988 event occurred because the NSOs determining OOS boundaries for the relay removal were not knowledgeable of the overall effect of pulling the selected control power fuses. Both events resulted in rendering two trains of the NAFPE system inoperable for several hours.

During the time the two NAFPE system trains were inoperable, one operable non-accessible area plenum was available to provide 50% system capacity. The licensee provided the staff with an analysis which demonstrates that offsite doses and doses to control room personnel would have been maintained within the limits of 10 CFR 100 and 10 CFR 50, Appendix A, Criterion 19, with a complete loss of non-accessible area ventilation considering the small emergency core cooling system leakage and the low RCS coolant source term that existed at the time of the event.

The licensee should re-evaluate its corrective actions associated with the operational readiness inspection concerns and identified in LERs 87-063-00 and 87-063-01. The individuals determining the boundaries should be technically proficient in the OOS equipment affected. Management should also ensure that prior to taking a system out of service and after implementing an OOS, a determination, relative to present plant status, should be made to ensure that repetition of this type of event does not occur.

The NRC recognizes that the root causes for these events are similar although different in origin; however, the overall effect on safety-related system operability is considered unacceptable. The NRC is concerned that these events are indicative of inadequate performance by licensee management in ensuring the operability of safety-related systems.

8. Exit Interview (30703)

The inspector met with the licensee representatives denoted in Paragraph 1 at the conclusion of the inspection on March 25, 1988. The inspector 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.