

# U.S. NUCLEAR REGULATORY COMMISSION

## REGION III

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Report Nos: 50-373/96-18; 50-374/96-18

Licensee: Commonwealth Edison Company

Facility: LaSalle County Station, Units 1 and 2

Location: 2601 N. 21st Road  
Marseilles, IL 61341

Dates: October 26 - December 13, 1996

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## EXECUTIVE SUMMARY

LaSalle County Station, Units 1 and 2  
NRC Inspection Report 50-373/96-18; 50-374/96-18

This inspection included aspects of licensee operations, maintenance, engineering, and plant support. The report covers a seven-week period of inspection activities by the resident staff.

The licensee's failure to ensure that the control room and auxiliary electric equipment room ventilation systems could perform their design function during accident conditions, reflected a lack of understanding of the plant's design and licensing basis. In addition, examples of the failure to identify and/or correct significant conditions adverse to quality continue to be identified. The examples identified during this report period are of particular concern because they represent potential common-mode failures of safety-related equipment in multiple systems.

### Plant Operations

- As a result of poor work planning and insufficient response to equipment concerns, ventilation coils froze rendering the non-safety-related station heating system and associated ventilation systems inoperable. (Section O1.2)
- The inspectors identified that the surveillance procedure for the fast start test of the emergency diesel generator did not contain acceptance criteria for the parameter of air receiver pressure drop measured during the surveillance test. Although the licensee trends this parameter, the licensee does not have a formal mechanism in place, such as established test acceptance criteria, to ensure that a significant change in the measured value of this parameter, which is potentially indicative of starting air system degradation, is evaluated in a timely manner. (Section O2.1)
- The inspectors identified a violation involving the failure of an operator to have a surveillance test procedure at his assigned work location for periodic reference to confirm that all procedure steps have been performed and to document steps as required. (Section O3.1)
- The inspectors identified that licensed operator training lesson plans for the control room and auxiliary electric equipment room (AEER) ventilation systems were deficient in that they did not address operation of the recirculating charcoal filters in the event of a high radiation condition. (Section O4.1)

### Maintenance

- Maintenance activities observed by the inspectors were conducted in accordance with work instructions, involved workers appeared knowledgeable of assigned work activities, and the involvement of operations and engineering department personnel was adequate for the work performed. (Section M1.1)

- The licensee's failure to implement timely corrective actions for an inoperable breaker event in April 1995 resulted in a similar event in October 1996 with two safety-related motor control center supply breakers. An apparent violation was identified for inadequate corrective actions for this event. (Section M2.1)
- The licensee did not identify the presence of foreign material in the Unit 2 suppression pool, which could have potentially caused a common-mode failure of the emergency core cooling system, due to an inadequate inspection of the pool in March 1995. An apparent violation was identified for the failure to identify and correct this significant condition adverse to quality during previous inspections of the Unit 2 suppression pool. (Section M2.2)

#### Engineering

- The licensee did not conduct adequate testing to demonstrate that the control room and AEER ventilation systems would operate as specified in the Updated Final Safety Analysis Report and Technical Specifications following a design basis accident. Three apparent violations were identified for this condition which existed since initial plant startup. The apparent violations pertain to inoperability of the AEER ventilation system, two examples of inadequate tests which resulted in missed opportunities to identify this problem earlier, and an inadequate surveillance test for ensuring operability of the control room ventilation system. (Section E2.1)
- An apparent violation was identified for the licensee's failure to take appropriate corrective action for degradation of safety-related single block module (SBM) electrical control switches due to hydrocarbon exposure and excessive age. (Section E2.2)

#### Plant Support

- Corrective actions implemented by the licensee to address previously identified performance problems with radiation worker practices appear to have been effective in the near-term. (Section R1.1)

## Report Details

### Summary of Plant Status

Unit 1 was in a forced outage for the entire inspection period and Unit 2 remained shut down for a refueling outage. On November 18, 1996, the licensee decided to keep both units shut down to address equipment and human performance problems.

### I. Operations

#### **O1 Conduct of Operations**

##### **O1.1 General Comments (71707)**

The inspectors conducted frequent reviews of ongoing plant operations using Inspection Procedure 71707. Walkdowns were performed in the main control room, emergency diesel generator rooms, auxiliary electrical equipment rooms, safety-related pump rooms, the reactor building, the turbine building, and the radwaste facility. The inspectors also discussed the status of the plant with operating shift personnel in the control room.

##### **O1.2 Potential Operation of Standby Gas Treatment (SBGT) System Outside the Design Basis**

###### **a. Inspection Scope (71707)**

The inspectors reviewed the licensee's plans for shutting down the reactor building ventilation system and operating the SBGT system to control reactor building differential pressure and ventilation.

###### **b. Observations and Findings**

In 1996, the licensee modified the turbine building ventilation system by adding several chillers to the system. The modification was performed to address high building temperatures during the summer, as well as the inability to consistently maintain the turbine building at a negative pressure. As discussed in NRC Inspection Report 50-373/95009; 50-374/95009, the modification added the chillers to the existing station heating system. The station heating system is designed to conserve heat in the winter by preheating the ventilation air to the reactor building, turbine building, and radwaste building with recaptured heat from the drywell.

In preparation for installing the modification, the station heating system was drained. However, system heat exchangers were not totally drained because portions of the heat exchangers were at lower elevations than the system drains. The licensee became concerned over possible freezing of heat exchanger piping in mid-September with the onset of colder weather. However, the licensee did not

take any actions to address this concern, and as a result, several heat exchangers in the reactor building, turbine building, and radwaste building ventilation systems ruptured when water in the heat exchanger piping froze. The licensee proceeded to replace the heat exchangers to restore station heat and maintain plant temperatures.

To prevent the intake of cold air and further freezing of the station heating system piping, the licensee shut down all ventilation systems and operated the SBGT system to maintain secondary containment at a negative pressure. Per Technical Specification requirements, the licensee intended to perform charcoal and high efficiency particulate air (HEPA) filter sampling of the SBGT system after 720 hours of operation. Based on a review of the system's configuration and operating procedures and the results of discussions with the licensee, the inspectors were concerned that the licensee was operating the SBGT system outside its design basis. The inspectors questioned if the licensee had evaluated system operating procedures to determine the effect of operating the SBGT system as the primary ventilation system and the long-term effects of continuous system operation on specific components such as charcoal and HEPA filters. Operation of the SBGT system as a compensatory measure for an inoperable station heating system and associated ventilation systems is considered an Unresolved Item (50-373/96018-01; 50-374/96018-01) pending NRC review of the SBGT system's design basis and the results of the licensee's analysis of the long-term effects of continuous system operation.

c. Conclusions

As a result of poor work planning and insufficient response to equipment concerns, ventilation coils froze which rendered the non-safety-related station heating system and associated reactor building, turbine building, and radwaste building ventilation systems inoperable.

**02 Operations Procedures and Documentation**

**02.1 Emergency Diesel Generator (EDG) Surveillance Procedure Acceptance Criteria**

a. Inspection Scope (61726)

The inspectors observed the licensee conduct LaSalle Operating Surveillance (LOS) DG-M2, "1A (2A) Diesel Generator Operability Test," and reviewed the surveillance test results. The inspectors also discussed their observations with the operations engineer.

b. Observations and Findings

The inspectors observed that the pressure drop of the starting air receivers was one of the parameters measured and recorded by the licensee during the monthly EDG surveillance test conducted per procedure LOS-DG-M2. The inspectors noted, however, that the surveillance procedure did not contain acceptance criteria for air receiver pressure drop. The inspectors asked the operations engineer why the

pressure drop data was recorded and the basis for not specifying acceptance criteria for this measured test parameter. The operations engineer did not know why data was obtained during the surveillance test for this particular parameter and questioned the diesel generator system engineer. The system engineer responded that the parameter was trended to evaluate degradation of the air start motor and starting air system. Based on discussion with the system engineer, the inspectors learned that the licensee may not evaluate the pressure drop data for up to three months after obtaining it during the monthly surveillance test.

The inspectors also noted that operations personnel tasked with conducting the surveillance test identified some problems with the test procedure. The surveillance procedure contained instructions for both a slow speed start and a fast speed start. Involved operators identified that procedure attachment E2, a data sheet for the local operator's use, was confusing with regard to which data pertained to fast versus slow speed start testing.

c. Conclusions

The inspectors concluded that the licensee did not have a formal mechanism in place, such as established test acceptance criteria, to ensure that a significant change in the parameter of air receiver pressure drop is evaluated in a timely manner. An excessive drop of starting air receiver pressure during an EDG fast start could be indicative of a degraded air start motor and/or starting air system, or other EDG problem. Although the licensee trends this parameter, test data may not be evaluated for up to three months and as a result, degradation of the EDG or the starting air system may not be evaluated for operability in a timely manner. The inspectors reviewed pertinent licensing and design basis documentation, including Technical Specifications and the Updated Final Safety Analysis Report, and did not identify any specific requirements to test or trend emergency diesel generator air receiver pressure drop.

**03 Operator Knowledge and Performance**

**03.1 Operator Conducting Surveillance Test Without the Surveillance Procedure at the Work Location**

a. Inspection Scope (71707)

The inspectors observed the licensee conduct LOS-DG-Q2, "1A DG [Diesel Generator] Auxiliaries," reviewed the surveillance test results, and verified that test acceptance criteria were appropriate. The inspectors also discussed their observations with the operators performing the surveillance test and the operations manager.



b. Observations and Findings

While observing the licensee conduct a surveillance test per LOS-DG-Q2, the inspectors noted that the operator stationed at the EDG cooling water pump did not have a copy of the procedure. The procedure directs the operator to perform several actions at the local pump operating station, such as valve manipulations, recording of instrument readings, and installing a temporary day tank sightglass. The inspectors further noted that procedure LOS-DG-Q2 is classified as a "Reference Use" procedure. Per LaSalle Administrative Procedure (LAP) 100-40, "Procedure Use and Adherence Expectations," procedures classified as "Reference Use" are required to be available at the work location for periodic reference to confirm that all procedure steps have been performed and to document steps as required.

c. Conclusions

The failure of the operator stationed at the EDG cooling water pump to have a copy of surveillance test procedure LOS-DG-Q2 available at his assigned work location, as required by LAP-100-40, is considered a violation of Technical Specification 6.2.A.a, as described in the attached Notice of Violation (50-373/96018-02).

**04 Operator Training and Qualification**

04.1 Licensed Operator Lesson Plans

a. Inspection Scope (71707)

The inspectors reviewed the lesson plans for licensed operator training on the control room (CR) and the auxiliary electric equipment room (AEER) ventilation systems to determine if the lesson plans were consistent with design basis information.

b. Observations and Findings

Section 6.4.1 of NUREG 0519, "Safety Evaluation Report related to the operation of LaSalle County Station Units 1 and 2," stated that the licensee had committed to "make provisions to manually initiate the control room heating, ventilating, and air conditioning supply air filters on receipt of a high radiation alarm from an outside air intake." These recirculating charcoal filters are designed for smoke and odor removal and are in addition to once-through charcoal filters which are part of the emergency filtration trains that automatically initiate upon detection of a high radiation condition in the outside air intakes. To meet the Safety Evaluation Report (SER) commitment, the licensee developed an alarm response procedure which required operators to place the CR and AEER charcoal filters in service under high radiation conditions.

The inspectors identified that the lesson plans for licensed operator training on the CR and AEER ventilation systems did not address operator actions described in the

SER. The inspectors did not find any reference in the lesson plans to placing the recirculating charcoal filters in service in the event of a high radiation condition in the shared CR and AEER ventilation systems' intake plenum. The inspectors confirmed, through interviews with several licensed operators, that operators were not instructed to place the CR and AEER charcoal filters in service upon detection of high radiation at the air intake. These operators were not cognizant of the function of the charcoal filters in the event of high radiation. The licensee initiated a lesson plan review to determine appropriate corrective action for this identified training discrepancy.

c. Conclusions

Licensed operators were not cognizant of the function of the recirculating charcoal filters and the required actions for these filters in the event of a high radiation condition. The inspectors attributed this to a deficiency in licensed operator training lesson plans for the CR and AEER ventilation systems which did not address operation of the recirculating charcoal filters in the event of a high radiation condition detected at the air intake. However, the associated alarm response procedure contained appropriate guidance on required operator actions with respect to the charcoal filters. Although the licensee did not conduct specific training on required operator actions, the inspectors concluded that there was reasonable assurance that operators would take the appropriate actions in the event of a high radiation condition based on the premise that operators would follow the alarm response procedure.

## II. Maintenance

### **M1 Conduct of Maintenance**

#### **M1.1 General Comments**

a. Inspection Scope (62703)

Using Inspection Procedure 62703, the inspectors observed the following maintenance activities:

- Work Request (WR) 96-0093551, "Inspect/repair A RHR [residual heat removal] service water pump discharge stop valve"
- WR 960104145, "Replace seal cooler because its design pressure is too low"

b. Observations and Findings

Licensee personnel performed work in accordance with the work instructions. The workers appeared knowledgeable of assigned work activities and the involvement of operations and engineering department personnel was adequate for the work performed.



## **M2 Maintenance and Material Condition of Facilities and Equipment**

### **M2.1 Inadequate Corrective Action For Misaligned Breaker**

#### **a. Inspection Scope (62703)**

The licensee notified the NRC on October 30, 1996, that Unit 1, Division 2, 480 Volt safety-related motor control centers (MCCs) 136X-1 and 136X-2 were inoperable. The inspectors reviewed the circumstances of the event, breaker maintenance histories and procedures, and corrective actions for a similar breaker failure in April 1995.

#### **b. Observations and Findings**

During a routine breaker inspection, a system engineer discovered misaligned mechanical trip mechanisms on supply breakers for MCCs 136X-1 and 136X-2. The licensee subsequently determined that the breakers were not fully inserted into their respective breaker cubicles preventing the mechanical trip interlocks for each breaker from completely disengaging. In this condition, vibration or jarring of the breaker could cause the trip interlock to actuate, preventing breaker closure or causing the breaker to trip open if it was already closed. With the supply breakers open, normal and emergency power would not be available to the MCCs and associated Division 2 loads, such as CR and AEER ventilation fans and the 1A EDG room ventilation dampers.

The licensee determined that MCCs 136X-1 and 136X-2 had been inoperable since February 1996, when their supply breakers were returned to service following maintenance. The supply breaker for MCC 136X-1 was not properly racked into its breaker cubicle when it was returned to service. An additional one-half turn on the racking mechanism was required for the breaker to be fully racked into its cubicle. The additional one-half turn would have allowed a required air gap (disengagement) to exist between the mechanical trip interlock and a paddle on the trip shaft of the breaker. The mechanical trip interlock for the supply breaker to MCC 136X-2 could not be fully disengaged due to a breaker alignment problem which prevented the breaker from being fully racked into its cubicle. The licensee did not identify this condition since no check of the mechanical trip interlocks was performed when the supply breakers were returned to service in February 1996. During the more recent breaker inspection, the licensee determined that mechanical adjustments to the breaker were required to fully rack the breaker into its cubicle.

The licensee identified that a similar failure occurred with the common emergency diesel generator cooling water (EDGCW) pump breaker on April 15, 1995. The licensee determined that the racking mechanism, including the mechanical trip interlock, for this breaker was not properly adjusted when the breaker was inserted into its cubicle. In response to this event, the licensee inspected all 480 volt switchgear breakers. The licensee also planned to revise 480 volt AC switchgear electrical maintenance (EM) procedures to require inspection of the trip interlock mechanism before returning a breaker to service.

Electrical maintenance personnel used LaSalle Electrical Surveillance (LES) procedure LES-GM-105, "Inspection of Low Voltage Air Circuit Breakers," to perform maintenance on breakers. This procedure did not contain guidance for inspecting the trip interlock before returning a breaker to service. The EM procedure was appropriately revised in February 1996, however, the 136X-1 and 136X-2 supply breakers were returned to service before the procedure revision was in effect. In addition, EM personnel were not always present when breakers were racked into position by operators. The licensee did not revise operating procedures to provide for a check of the mechanical trip interlock gap.

The licensee's corrective actions for the inoperable condition of the MCC 136X-1 and 136X-2 supply breakers included an inspection of the 480 volt safety-related MCC breakers to ensure the mechanical trip interlock mechanisms were properly adjusted, revision of LaSalle Operations Procedure LOP-AP-20, "480 Volt Air Circuit Breaker Operation," additional equipment operator training, and repair of the MCC 136X-1 and 136X-2 supply breakers.

c. Conclusions

The licensee's corrective actions to prevent recurrence of the 1995 breaker misalignment problem with the EDGCW pump breaker were not adequate or timely. As a result, similar problems occurred with the MCC 136X-1 and 136X-2 supply breakers. The condition of the MCC supply breakers was safety significant in that the breakers may have opened during a seismic event interrupting normal and emergency power to those safety-related loads supplied by the respective MCCs. The breaker alignment problems also represented a potential common-mode failure that could have simultaneously affected multiple safety-related systems. The failure to implement adequate and timely corrective actions for the April 1995 common EDGCW pump breaker failure is considered an example of an apparent violation of 10 CFR 50, Appendix B, Criterion XVI (50-373/96018-03a; 50-374/96018-03a).

M2.2 Inadequate Corrective Action for Foreign Material in Suppression Pool

a. Scope (62703)

As discussed in NRC Inspection Report 50-373/96013; 50-374/96013, the licensee identified considerable debris in the Unit 2 suppression pool during an inspection and cleaning of the pool in October 1996. During this inspection period, the inspectors completed a review of the foreign material exclusion (FME) program and the results of previous suppression pool inspections conducted by the licensee.

b. Observations and Findings

The inspectors observed the foreign material removed by divers during cleaning and desludging of the Unit 2 suppression pool on October 12, 1996. The licensee concluded that the foreign material had been in the pool, under the bottom silt layer, since initial construction or one of the first few Unit 2 outages. The emergency core cooling system (ECCS) analysis in the Updated Final Safety Analysis Report

(UFSAR) assumes a limit of 50 percent for blockage or clogging of the ECCS suction strainer surface areas. The licensee determined that the amount of material in the suppression pool was sufficient to block greater than 50 percent of the ECCS suction strainers' surface area. This was based on the presumption that enough suppression pool turbulence would exist during a design basis accident to cause the material to migrate from the bottom of the pool to the ECCS suction strainers.

Blockage of the ECCS suction strainers could result in inadequate net positive suction head to the ECCS pumps.

The licensee did not identify the foreign material during suppression pool cleanliness inspections conducted in refueling outages L2R03 and L2R06. The licensee most recently inspected the Unit 2 suppression pool on March 16, 1995, in response to NRC Bulletin 93-02. During these inspections, the licensee focused on removing foreign material that was detectable without disturbing the bottom silt layer. The licensee did not consider removing the silt from the Unit 1 and Unit 2 suppression pools until learning of an event at another plant involving strainer blockage due to the accumulation of silt and other foreign material. The licensee completed desludging the Unit 1 and Unit 2 suppression pools in the Spring of 1996 and in October 1996, respectively. The inspectors reviewed the licensee's FME program and determined that suitable controls had been implemented to prevent additional debris from accumulating in the suppression pools.

c. Conclusions

The accumulation of foreign material in the Unit 2 suppression pool was caused by the failure to implement an effective FME program during initial construction and the first few unit outages. The licensee did not identify the presence of foreign material earlier due to inadequate inspections. The licensee had strengthened FME controls before discovering the material in the silt layer of the Unit 2 suppression pool in October 1996. The foreign material could have potentially caused a common-mode failure of the ECCS. The failure to identify and correct this significant condition adverse to quality during previous inspections of the Unit 2 suppression pool, is considered an example of an apparent violation of 10 CFR 50, Appendix B, Criterion XVI (50-373/96018-03b; 50-374/96018-03b).

M8 Miscellaneous Maintenance Issues (92700)

M8.1 (Closed) Licensee Event Report (LER) 373/94013-00: Reactor core isolation cooling (RCIC) system declared inoperable due to control system oscillations. The inspectors verified that the licensee had completed corrective actions described in the associated LER, including revision of LaSalle Instrument Surveillance LIS-RI-115/215. This item is considered closed.

M8.2 (Closed) LER 50-373/374-96014: 480V safety-related switchgear breakers in degraded condition due to untimely implementation of a previous corrective action. This event is discussed in Section M2.1 of this report. The inspectors determined

that the licensee did not implement adequate corrective action for a similar problem identified in April 1995. This item is considered closed.

- MB.3 (Closed) Unresolved Item 50-374/94013-04: Foreign material found in the Unit 2 suppression pool. This item is discussed in Section M2.2 of this report. The inspectors determined that the licensee did not identify and correct a significant condition adverse to quality, specifically, the presence of foreign material in the Unit 2 suppression pool, during previous suppression pool inspections. This item is considered closed.

### III. Engineering

#### **E2 Engineering Support of Facilities and Equipment**

##### **E2.1 Control Room (CR) and Auxiliary Electric Equipment Room (AEER) Ventilation Systems Outside Design Basis**

###### **a. Inspection Scope (37551, 92903)**

On October 30, 1996, the licensee reported to the NRC that Unit 1 and Unit 2 had operated in an unanalyzed condition in that the AEER could not be maintained at a positive pressure as specified in the UFSAR. The licensee subsequently identified that control room ventilation system surveillance testing was not adequate to ensure compliance with Technical Specification requirements. A system engineer identified these issues while reviewing plans for implementation of the Improved Standard Technical Specifications (ISTS). The inspectors reviewed the design basis for the CR and AEER ventilation systems, reviewed operating procedures, performed system walkdowns, observed maintenance activities, and discussed system operation and design with operations and engineering department personnel. The inspectors also reviewed system test results and an AEER ventilation system modification.

###### **b. Observations and Findings**

The inspectors reviewed Problem Identification Form (PIF) 96-3060 pertaining to the failure to consider AEER habitability consequences from removal of the main steam isolation valve leakage control system (MSIVLCS). Removal of the MSIVLCS affected postulated dose rates in the AEER following a design basis accident. The licensee had not evaluated the impact on AEER dose rates before removing the Unit 1 MSIVLCS from service in early 1996. The licensee had not removed the MSIVLCS from Unit 2. The inspectors determined through a review of licensing documents that the NRC had previously approved removal of operability requirements for the MSIVLCS from the Technical Specifications for both Unit 1 and 2 on April 5, 1996, with Amendments 97 and 112, respectively. While the licensee's supporting analysis for these amendments considered the effect of MSIVLCS removal on offsite and control room doses, an evaluation of the effects on AEER habitability was not included.



The licensee identified other issues relating to habitability of the AEER. Specifically, the licensee determined through testing in October 1996 that the AEER ventilation system could not maintain the AEER at a positive pressure of 1/8 inch water column (WC) as specified in Section 6.4 of the UFSAR. The licensee determined that with AEER pressure less than 1/8 inch WC the post-accident dose to personnel in the AEER would have exceeded the limits in General Design Criteria (GDC) 19. Consequently, the licensee concluded that the AEER ventilation system was inoperable since it was unable to perform its intended safety function. Technical Specification 3.7.2 requires that two independent control room and AEER emergency filtration trains be operable. The failure to maintain the AEER ventilation system operable since initial plant operation is considered an apparent violation of TS 3.7.2 (50-373/96018-04; 50-374/96018-04). At the end of the inspection period, the licensee was in the process of reviewing possible corrective actions to ensure AEER habitability requirements are met during postulated accident conditions.

The inspectors also reviewed PIF 96-3014 pertaining to the lack of testing to demonstrate that the AEER ventilation system could maintain the AEER at a pressure of 1/8 inch WC relative to surrounding areas. The inspectors identified two missed opportunities for the licensee to identify and correct AEER ventilation deficiencies:

- The AEER ventilation system pre-operational test, PT-VE-101, "Auxiliary Electric Room HVAC (Heating, Ventilation, and Air Conditioning)," specified acceptance criteria of 1/8 inch WC for differential pressure (DP) between the AEER and surrounding areas. During the initial pre-operational test, a DP of 1/8 inch WC could not be maintained. The licensee subsequently revised the test acceptance criteria for DP to 1/16 inch WC and conducted a second pre-operational test after making some system configuration changes. In June 1982, the licensee considered the results of the second test acceptable based on the revised acceptance criteria. The licensee did not evaluate the revision to the test acceptance criteria with respect to the ventilation system's design and licensing basis. The failure to incorporate appropriate acceptance criteria defined in applicable design documents in the AEER pre-operational test is considered an example of an apparent violation of 10 CFR 50, Appendix B, Criterion XI (50-373/96018-05a; 50-374/96018-05a).
- The licensee modified the ventilation system supplying the computer room in 1982 and 1984. The 1982 portion of the modification added a separate computer room ventilation system, while the 1984 portion blanked off the former AEER ventilation supply to the computer room. The licensee did not conduct adequate post-modification testing. The test, conducted after both portions of the modification were complete, only verified that 100 cubic feet per minute of air flow could be routed around the computer room and did not address the ability of the AEER ventilation system to maintain the required design DP of 1/8 inch WC. The failure to incorporate appropriate acceptance criteria defined in applicable design documents in the AEER post-modification

test is considered another example of an apparent violation of 10 CFR 50, Appendix B, Criterion XI (50-373/96018-05b; 50-374/96018-05b).

The licensee also identified on November 6, 1996, a deficiency with surveillance testing of the CR ventilation system. LaSalle Technical Surveillance procedure LTS-400-17, "Control Room HVAC Isolation Damper Surveillance Smoke and Radiation Detection," Revision 5, did not verify the capability of the CR ventilation system to maintain a positive pressure in the CR relative to all surrounding areas. The surveillance test only evaluated the pressure of the CR relative to the Auxiliary Building and Turbine Building areas adjacent to the CR. The test did not evaluate the pressure of the CR relative to areas adjacent to the top and bottom of the CR and adjacent areas in the secondary containment. No installed instruments existed in the areas above and below the CR, nor in secondary containment, that would allow measurement of the differential pressure between the CR and these areas.

Technical Specification 4.7.2.d requires that each CR emergency filtration system train be demonstrated operable at least once per 18 months by verifying that the emergency train automatically switches to the pressurization mode of operation on an actuation signal and maintains the CR at a positive pressure of 1/8 inch water gauge relative to adjacent areas. The failure to test the CR ventilation system since initial plant operation to ensure that the CR can be maintained at the specified positive pressure relative to all adjacent areas, is considered an apparent violation of TS 4.7.2.d (50-373/96018-06; 50-374/96018-06). The licensee committed to perform suitable as-found testing to determine if the control room ventilation system could operate within its design basis.

c. Conclusions

Since initial plant startup, the licensee had not conducted adequate testing to demonstrate that the CR and AEER ventilation systems would operate as specified in the UFSAR and TS following a design basis accident. The inspectors concluded that the AEER ventilation system had been inoperable since initial plant startup since it was not capable of performing its intended safety function of maintaining a positive pressure of 1/8 inch WC to ensure that dose rates to operators were within the limits prescribed by GDC 19 in the event of a design basis accident.

E2.2 Inadequate Corrective Action for General Electric (GE) Control Switch Degradation

a. Scope (37551)

The licensee replaced the electrical control switch for the 1B reactor recirculation pump on October 26, 1996, due to problems encountered during downshift of the recirculation pump speed. Based on the results of detailed walkdowns and analysis, the licensee expanded the scope of control switch replacement to include approximately 1150 switches that were determined to be safety-related and important to safety. The inspectors reviewed the results of the licensee's investigation and associated documentation.



b. Observations and Findings

The licensee concluded that the contacts in the reactor recirculation pump switch were misaligned. The misalignment was caused by broken cam followers, which rotated when the switch was turned. The contacts were attached to the cam followers. The switch was one of numerous single block module (SBM) electrical control switches manufactured by GE that were used extensively throughout the plant. The licensee determined that exposure to hydrocarbons in the past could cause similar SBM switch degradation and failure. The licensee determined, through further review of GE literature, that the 21-year qualified life of the switches may have been exceeded.

The inspectors identified the following missed opportunities by the licensee to address SBM switch degradation:

- In 1979, GE personnel performed a walkdown of the LaSalle plant in response to GE Service Information Letter (SIL) 155. The SIL pertained to the use of Lexan, a clear plastic material, for the SBM switch cam followers. The Lexan material was subject to degradation related failures when exposed to hydrocarbons. The use of Lexan cam followers was discontinued by GE in 1976. During the LaSalle plant walkdown, GE personnel identified approximately 106 switches that were exposed to hydrocarbons during the manufacturing process. General Electric personnel provided the results of their inspection to the licensee, however, the licensee did not replace the affected switches.
- In 1990, in response to problems with the Division 3 switchgear for both LaSalle units, GE personnel inspected various electrical equipment. During these inspections, GE personnel identified installed SBM switches on the switchgear which had been included in the 1979 list of switches exposed to hydrocarbons during the manufacturing process. The licensee replaced these SBM switches, however, the licensee did not expand the replacement effort to Division 1 and 2 switchgear. The licensee also banned further use of hydrocarbon-based contact cleaner.
- In 1995, engineering personnel reviewed the SBM issue in response to industry information on SBM problems experienced by other licensees. This review included the SIL and the GE walkdown results. However, the licensee erroneously assumed that all defective SBM switches had been replaced when the issue was previously addressed in 1979 and 1990. Based on this assumption, in conjunction with the observed switch failure rate to date at LaSalle, the licensee determined that a new SBM switch inspection was not warranted.

c. Conclusions

Degraded SBM switches due to hydrocarbon exposure and excessive age represented a potential common-mode failure which could simultaneously affect multiple safety-related systems. The failure to take appropriate corrective action for safety-related SBM switch degradation concerns identified in 1979, 1990, and 1995 is considered an example of an apparent violation of 10 CFR 50, Appendix B, Criterion XVI (50-373/96018-03c; 50-374/96018-03c).

**E8 Miscellaneous Engineering Issues (92700)**

- E8.1 (Closed) LER 50-373/374-96017: Main control room found outside design basis due to inadequate TS surveillance procedure. This issue is discussed in Section E2.1. This item is considered closed.
- E8.2 (Closed) LER 50-373/374-96012: AEER did not meet GDC 19 habitability requirements due to failure to understand the design and licensing basis. This issue is discussed in Section E2.1. This item is considered closed.
- E8.3 (Closed) Unresolved Item 50-373/374-96013-07: NRC review of licensee dose calculations and AEER pressurization testing. The inspectors evaluated this issue during review of the CR and AEER ventilation issues discussed in Section E2.1. This item is considered closed.
- E8.4 (Open) LER 50-373/374-96018: Residual heat removal (RHR) pump seal coolers did not meet design pressure rating requirements.

The licensee identified that RHR system pump seal coolers did not meet design pressure requirements on the shell side of the coolers. The shell side of the coolers was supplied with service water at an operating pressure of 150 psig. However, the design pressure of the installed coolers is 75 psig. At the end of this inspection period, the licensee was in the process of replacing the existing seal coolers with ones designed for 150 psig. The inspectors observed installation activities for some of the coolers and did not identify any problems. The licensee also conducted a review to determine if similar design problems existed with other coolers which used service water for cooling of ECCS components. This LER will remain open pending NRC evaluation of the root cause for the design discrepancy.

**IV. Plant Support**

**R1 Radiological Protection and Chemistry Controls**

**R1.1 Radworker Performance**

a. Inspection Scope (71750)

The inspectors observed the radiation worker practices of maintenance, engineering, and operations personnel in the radiological protected area. The inspectors also

discussed radiation control and as-low-as-reasonably-achievable (ALARA) control practices with radiation protection technicians.

b. Observations and Findings

Radiation protection technicians provided appropriate oversight of observed work activities, insuring that workers were cognizant of low dose areas at the work sites. The technicians also implemented appropriate controls for the removal of contaminated components from the work sites.

c. Conclusions

The inspectors did not identify any concerns with observed radiation worker performance. Corrective actions implemented by the licensee to address previously identified performance problems appear to have been effective in the near-term.

**V. Management Meetings**

**X1 Exit Meeting Summary**

The inspectors presented the results of their inspections to licensee management listed below at an exit meeting on December 13, 1996. The licensee acknowledged the findings presented. The inspectors asked the licensee if any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

**X3 Management Meeting Summary**

NRC and Commonwealth Edison management met at the NRC Region III offices on November 19, 1996, to discuss the licensee's initiative to have an independent safety assessment (ISA) of LaSalle County Station and Zion Station conducted by a contractor. At this meeting, the licensee described the purpose of each ISA, organization and staffing of the ISA team, the scope of each assessment, and the proposed schedule. The licensee stated that the ISA would consist of a comprehensive review of historical performance at each facility to determine why previous improvement initiatives had not been successful and to ensure the licensee was focusing resources on appropriate issues.

## PARTIAL LIST OF PERSONS CONTACTED

### ComEd

- \*W. Subalusky, Site Vice President
- \*D. Ray, Station Manager
- \*L. Guthrie, Operations Manager
- \*A. Magnafici, Acting Maintenance Superintendent
- \*A. Javorik, System Engineering Supervisor
- \*D. Boone, Health Physics Supervisor
- \*R. Crawford, Work Control Superintendent
- \*P. Barnes, Regulatory Assurance Supervisor

\* Present at exit meeting on December 13, 1996.

## INSPECTION PROCEDURES USED

IP 37551	Onsite Engineering
IP 40500	Effectiveness of Licensee Controls in Identifying, Resolving, and Preventing Problems
IP 61726	Surveillance Observation
IP 62703	Maintenance Observation
IP 71707	Plant Operations
IP 71750	Plant Support Activities
IP 92700	Onsite Followup of Written Reports of Nonroutine Events at Power Reactor Facilities
IP 92903	Followup-Engineering

## ITEMS OPENED, CLOSED, AND DISCUSSED

### Opened

50-373/374-96013-01	URI	Use of SBT system to maintain reactor building pressure
50-373/96013-02	VIO	Failure to have surveillance procedure at work location
50-373/374-96018-03a	EEI	Inadequate corrective actions for misaligned breaker
50-373/374-96018-03b	EEI	Inadequate corrective actions for suppression pool debris
50-373/374-96018-03c	EEI	Inadequate corrective actions for safety-related SBM switch degradation concerns
50-373/374-96018-04	EEI	Failure to maintain AEER ventilation system operable
50-373/374-96018-05a	EEI	Failure to incorporate appropriate acceptance criteria into AEER ventilation pre-operational test
50-373/374-96018-05b	EEI	Failure to incorporate appropriate acceptance criteria into AEER ventilation post-modification test
50-373/374-96018-06	EEI	Failure to test the CR ventilation system to ensure the specified positive pressure relative to all adjacent areas

Closed

50-373/374-96012	LER	AEER found to not meet GDC 19 habitability requirements due to failure to understand the design and licensing basis
50-373/94013	LER	RCIC declared inoperable due to control system oscillations
50-373/374-96014	LER	480V safety-related switchgear breakers in degraded condition due to untimely implementation of a previous corrective action
50-373/374-96017	LER	Main control room found outside design basis due to inadequate TS surveillance procedure
50-373/374-96013-07	URI	NRC review of licensee dose calculations and AEER pressurization testing
50-373/374-96013-04	URI	Suppression pool FME

## LIST OF ACRONYMS USED

AEER	Auxiliary Electric Equipment Room
ALARA	As-Low-As-Reasonably-Achievable
CR	Control Room
ECCS	Emergency Core Cooling Systems
EDG	Emergency Diesel Generator
EDGCW	Emergency Diesel Generator Cooling Water
EM	Electrical Maintenance
FME	Foreign Material Exclusion
GDC	General Design Criteria
GE	General Electric
HEPA	High Efficiency Particulate Air
HVAC	Heating, Ventilation, and Air Conditioning
IFI	Inspection Followup Item
ISTS	Improved Standard Technical Specifications
LER	Licensee Event Report
LOS	LaSalle Operating Surveillance
MCC	Motor Control Center
MSIVLCS	Main Steam Isolation Valve Leakage Control System
NRC	Nuclear Regulatory Commission
PIF	Problem Identification Form
PDR	NRC Public Document Room
RCIC	Reactor Core Isolation Cooling System
RHR	Residual Heat Removal
SER	Safety Evaluation Report
SBM	Single Block Module
SIL	Service Information Letter
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
URI	Unresolved Item
WC	Water Column
W.G.	Water Gauge