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Licensee: Commonwealth Edison Company

Facility: LaSalle County Station, Units 1 and 2

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

Dates: March 22 through May 9, 1997

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## EXECUTIVE SUMMARY

LaSalle County Station, Units 1 and 2  
NRC Inspection Report 50-373/97-06(DRP); 50-374/97-06(DRP)

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

Licensee performance during this inspection period was characterized by continued instances of plant personnel failing to follow procedures. Although there appears to be a recent decrease in the overall rate of personnel errors, the procedure adherence issues identified during this inspection period indicate that some plant personnel still do not fully understand procedural requirements or place sufficient emphasis on management expectations for procedure compliance. Licensee corrective actions in this area to date have not been fully effective.

The use of incorrect engineering assumptions in an operability determination for a core standby cooling system ventilation panel mounting configuration and in determining the acceptability of an impaired fire barrier, demonstrated a lack of engineering rigor and thoroughness. The inspectors noted similarities in licensee performance between this issue and the June 1996, service water event. Corrective actions in response to the lack of engineering rigor and thoroughness exhibited during the service water event have not yet been fully effective.

### Plant Operations

- The inspectors identified that the licensee was implementing the process for managing shutdown risk using informal guidelines that had not been approved in accordance with the established procedure approval process. However, the guidelines were more comprehensive than the approved administrative procedure for shutdown risk management. (Section O1.1)
- The inspectors identified a violation involving the failure of operators to notify radiation protection department personnel of the need to perform a survey due to possible changes in radiological conditions following realignment of shutdown cooling through the B train of the residual heat removal (RHR) system. (Section O1.2)
- Operators incorrectly assumed that an RHR pump low discharge pressure alarm was caused by a low pressure condition created during performance of an operating surveillance test and did not identify the actual cause, activities associated with an instrument surveillance test being conducted concurrently, until prompted by the inspectors. The Unit Supervisor did not thoroughly review the surveillance tests to ensure that concurrent performance of the tests would not invalidate either test, and the Nuclear

Station Operator was not aware that an instrument surveillance test was being performed at the same time as the operational surveillance test. (Section O1.3)

- The licensee identified a violation (non-cited) involving a reactor operator and several senior reactor operators performing licensed duties with inactive licenses due to the licensee's mis-interpretation of what constitutes "performing the functions of an operator or senior operator" in maintaining an active license. In one instance, the licensee failed to maintain the Technical Specification-required minimum control room staffing level, which was considered a non-cited violation. (Section O5.1)

#### Maintenance

- The inspectors identified that for 25 percent of valve stroke time tests, valve stems and stem nuts were cleaned and lubricated immediately before performing the test. The inspectors determined that this practice was the result of efforts to more efficiently schedule work rather than an attempt to pre-condition the valves to ensure surveillance test acceptance criteria would be satisfied. (Section M2.1)
- The inspectors identified several material condition and housekeeping deficiencies in the Unit 1 primary containment. (Section M2.2)
- The licensee identified a violation involving the failure of electricians to follow licensee administrative requirements when the sequence of procedure steps for a relay logic test was changed. (Section M4.1)

#### Engineering

- The inspectors identified a violation involving either the failure to incorporate the actual mounting configuration of some safety-related ventilation panels into design drawings and generate supporting seismic calculations during original plant construction, or the inability to retrieve the associated design documents. Due to the licensee's extended plant shutdown to address long-standing performance problems, the NRC is exercising enforcement discretion for this violation in accordance with the NRC Enforcement Policy and a Notice of Violation is therefore not being issued. (Section E2.1)
- Engineering personnel made an incorrect assumption with regard to an operability conclusion following inspector questions concerning mounting of a core standby cooling system ventilation control panel. Engineering personnel placed insufficient emphasis on timely verification of that assumption. (Section E2.1)
- The inspectors identified an impaired fire barrier in a 125 volt battery room. The licensee had closed a work package and associated modification in 1990 without returning the fire barrier to an acceptable status. A system engineer with knowledge of the fire barrier impairment in early 1997, assumed that the condition of the fire barrier had been evaluated as acceptable during the modification

installation without verifying that this assumption was correct. As a result, the licensee did not take appropriate actions to address the impairment until the impairment was later identified by the inspectors. (Section F2.1)

#### Plant Support

- The inspectors identified a violation involving a radiation protection technician's failure to properly establish a contamination area due to a lack of knowledge of administrative requirements in a radiation protection procedure. A grating in the area, open to the clean floor below, was not covered with plastic. Other radiation protection technicians demonstrated the same lack of knowledge during subsequent interviews with the inspectors. (Section R4.1)
- After being informed by the inspectors of an impaired fire barrier in a 125 volt battery room, the licensee responded adequately. (Section F2.1)

## 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. The licensee continued to keep both units shut down to perform design basis configuration reviews and to address equipment and human performance problems.

### I. Operations

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

##### **O1.1 Shutdown Risk Program Administration**

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

The inspectors evaluated plant activities which potentially impacted shutdown risk levels. The inspectors reviewed LaSalle Administrative Procedure (LAP) 100-47, "Shutdown Risk Management," Revision 0, the Shutdown Risk Guidelines for the Unit 2 refueling outage, and the Shutdown Risk Guidelines for forced and maintenance outages.

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

The licensee implemented the Shutdown Risk Guidelines for the Unit 2 refueling outage with goals specified to reduce the susceptibility of the plant to events that could challenge plant safety. The licensee evaluated the various maintenance tasks planned for the outage for any such increased susceptibility. If an increase in the level of risk was identified, the licensee implemented compensatory measures, such as protected pathways, to address the activity which increased the level of risk to the plant. The Shutdown Risk Guidelines incorporated the requirements specified in LAP-100-47, which defined the process for assessing and reducing the likelihood of events that may affect plant safety.

Through discussions with licensee management, the inspectors determined that the licensee was using the Shutdown Risk Guidelines instead of the applicable administrative procedure to control the shutdown risk program. The Shutdown Risk Guidelines were more comprehensive than the administrative procedure and incorporated additional information that could be used by plant personnel evaluating shutdown risk issues. Licensee personnel had already recognized that the administrative procedure was not being used to control shutdown risk activities and were revising the procedure to be a more useful tool.

c. Conclusions

The licensee was implementing the process for managing shutdown risk using informal guidelines that had not been approved in accordance with the established procedure approval process. However, the guidelines were more comprehensive than the approved administrative procedure for shutdown risk management.

O1.2 Failure to Follow Procedure During Shutdown Cooling System Realignment

a. Inspection Scope (71707)

The inspectors performed tours of the residual heat removal (RHR) pump and heat exchanger rooms, reviewed radiation protection surveys and logs, interviewed operators and radiation protection personnel, and reviewed LaSalle Operating Procedure (LOP) RH-07, "Shutdown Cooling System Startup, Operation, and Transfer," Revision 38.

b. Observations and Findings

On March 31, 1997, while preparing to tour the Unit 1 RHR pump and heat exchanger rooms, the inspectors identified that the posted radiation surveys for the RHR corner rooms were dated prior to a recent RHR system realignment. Operators had realigned the RHR system on March 29, 1997, to use train B for shutdown cooling. The inspectors noted that the radiation protection (RP) supervisor's log book did not contain entries which indicated that a radiation survey had been performed or that the RP department had been contacted by operations personnel and informed of the need to perform a radiation survey. The inspectors also noted that no entry had been made in the Unit 1 Operations Control Room Log to indicate notification of the RP department regarding the RHR realignment. A survey of the areas affected by the RHR realignment was necessary due to the possibility of changing radiological conditions. The inspectors informed licensee management.

The licensee subsequently determined that RP personnel were aware of the planned system realignment on March 29, 1997, as they had attended the shift briefing, but had not attended the heightened level of awareness brief just prior to the realignment. At 10:20 a.m., the RP supervisor heard an announcement by the Nuclear Station Operator (NSO) over the plant communication system that the A RHR pump was shut down. The RP supervisor informed an RP technician that the A RHR pump had been secured and directed the technician to perform a radiation survey in the area after time for the system to stabilize. At 2:14 p.m., the Unit 1 NSO announced that the B RHR pump was placed in operation and mentally noted that Step F.6 in LOP-RH-07 required that he notify the radiation protection department of changes in shutdown cooling alignments and to record the notifications and the names of the persons notified in the Unit Log. However, the control room operators subsequently failed to notify the RP department as required by LOP-RH-07. The RP technician performed the survey approximately two hours after the start of the B RHR pump. The posted survey was not changed since the new results did not differ significantly from the previous survey. The failure of the

NSO to notify the radiation protection department of the change in shutdown cooling alignment as required by LOP-RH-07 is considered an example of a violation of Technical Specification 6.2.A.a. (50-373/97006-01a; 50-374/97006-01a).

c. Conclusions

The failure of control room operators to notify RP department personnel of the need to perform a radiation survey due to possible changes in radiological conditions following realignment of shutdown cooling was a violation. A radiation survey performed following the system realignment did not indicate any changes in radiological conditions. However, the survey was not a part of a controlled evolution.

O1.3 Operations Control Room Personnel Not Aware of Equipment and Testing Status

a. Inspection Scope (71707)

The inspectors observed the operators performing a portion of LaSalle Operating Surveillance (LOS)-LP-Q1, "LPCS [Low Pressure Core Spray] System Inservice Test for Operating Conditions 1, 2, 3, 4, and 5," Revision 29, and reviewed LOP-RH-01, "Filling and Venting the Residual Heat Removal System," Revision 25, and LaSalle Instrument Surveillance (LIS) RH-116A, "Unit 1 RHR Pump 1A Discharge High/Low Pressure Calibration," Revision 2.

b. Observations and Findings

On April 21, 1997, operators received an A RHR pump low discharge pressure alarm after opening the A RHR water leg pump discharge valve during LPCS testing. (The LPCS and RHR train were in the same division and shared a common water leg pump.) If the A RHR pump low discharge pressure alarm annunciated after opening the valve, LOS-LP-Q1 directed the operators to fill and vent the A RHR train. The NSO informed the Unit Supervisor that the low discharge pressure alarm subsequently annunciated and that the procedure required the A RHR train to be filled and vented. The Unit Supervisor acknowledged the NSO and made the decision to recommence LOP-RH-01 following completion of LPCS testing.

The inspectors were aware that the Unit Supervisor had also given instrument maintenance (IM) technicians permission to concurrently perform LIS-RH-116A which would cause the A RHR pump low discharge pressure alarm to annunciate. Therefore, the inspectors questioned the NSO as to whether the alarm could have been caused by the other surveillance. The NSO discussed the alarm with the IM technicians and the Unit Supervisor and determined that the alarm resulted from activities related to LIS-RH-116A and not the activity that the NSO was performing as part of LOS-LP-Q1.

Inspectors determined that the NSO had not been aware that the IM technician was performing a test that would impact the low discharge pressure alarm, even though the alarm window had a green marking sticker attached indicating the alarm was

expected due to an IM test. The Unit Supervisor had not recognized that both the operating and IM surveillance tests involved the potential to actuate the alarm.

c. Conclusions

Operators incorrectly assumed that an RHR pump low discharge pressure alarm was caused by a low pressure condition created during performance of an operating surveillance test and did not identify the actual cause, activities associated with an instrument surveillance test being conducted concurrently, until prompted by the inspectors. The Unit Supervisor did not thoroughly review the surveillance tests to ensure that concurrent performance of the tests would not invalidate either test, and the Nuclear Station Operator was not aware that an instrument surveillance test was being performed at the same time as the operational surveillance test.

**05 Operator Training and Qualification**

**05.1 Control Room Staffing and Operator License Controls**

a. Inspection Scope (71707)

The inspectors reviewed an investigation performed by the licensee regarding problems identified with methods used by operators to maintain their license in an active status and other documentation associated with operator licenses.

b. Observations and Findings

On April 11, 1997, during performance of a quarterly surveillance required by LAP-200-10, "NRC Operator License Active Status Maintenance and Reactivation," Revision 3, the licensee identified that several senior reactor operators (SRO) and one reactor operator (RO), in the following instances, had not completed the necessary number of shifts to maintain an active license and had subsequently assumed licensed duties. The licensee's administrative procedure, LAP-200-10, required licensed operators to verify that their licenses were active prior to assuming licensed duties and to perform the functions of a RO or SRO a minimum of seven 8-hour shifts or five 12-hour shifts per calendar quarter to maintain an active license. The procedure defined a shift as "the time from which a watchstander assumes a position until he was relieved from that position, i.e., from turnover to turnover."

- One RO had not completed the necessary number of shifts to maintain an active license and, on April 6, 1997, inappropriately assumed licensed operator duties as one of the two NSOs assigned in the Unit 1 control room.
- One SRO only stood three 8-hour shifts in positions appropriate to maintain proficiency as a licensed SRO during the second quarter of 1996. This SRO inappropriately assumed the Shift Manager position on August 12, 16, and 21, and September 15, 1996.

- Two SROs did not have a sufficient number of shifts in positions appropriate to maintain proficiency as a licensed SRO during the second quarter of 1996. These SROs then assumed an SRO position requiring an active license during the third quarter of 1996.
- Three SROs did not have a sufficient number of shifts in positions appropriate to maintain proficiency as a licensed SRO during the third quarter of 1996. These SROs then assumed an SRO position requiring an active license on October 6, November 5, and November 10, 1996.

In the case of the NSO, he had inappropriately used a 4-hour partial shift to meet the 56 hours required by procedure. In the cases of the SROs, they had inappropriately counted the positions of the work control center (WCC) supervisor SRO and field supervisor toward meeting proficiency requirements. Actively performing the functions of an SRO, as defined in 10 CFR 55.4, required that an operator be assigned to a licensed position on the shift crew as defined in the LaSalle Technical Specifications. The LaSalle Technical Specification SRO licensed positions were the Shift Supervisor (Shift Manager) and the Shift Foreman (Unit Supervisor). Although the licensee's administrative procedure for maintaining active licenses, LAP-200-10, did not specify that the WCC SRO could be counted toward maintaining a license active, licensed operators indicated that this had been the accepted practice at LaSalle until August 1996.

The licensee identified in a root cause investigation that the administrative process in place for the maintenance of NRC operator licenses was ineffective and insufficient oversight of the program was provided by operations department management. Several immediate compensatory actions implemented included:

- Four SROs were removed from "active" license status and on-shift duties pending reactivation of their license in accordance with LAP-200-10.
- The Shift Operations Supervisor provided direction to the SROs regarding the inappropriate use of the WCC SRO position for active license maintenance.
- Shift Managers reviewed the requirements for active license maintenance with their crews, stressing that license maintenance was primarily the responsibility of the license holder.

Other long term corrective actions initiated included:

- A revision to LAP-200-10 to improve the process and clarify the requirements for active license maintenance. Direct Shift Manager oversight was specified and a control room active license log commenced to allow for management review of current license status prior to shift change.
- Revisions to the initial and continuing operator training programs to incorporate the specific license maintenance requirements.

- Additional training was to be provided to the operations time keepers to prepare them to properly implement the requirements of the Active License Tracking Program in accordance with LAP-200-10.

Paragraphs 10 CFR 50.54(k) and (l), "Conditions of licenses," require that an operator or senior operator, licensed pursuant to Part 55, be present at the controls at all times during the operation of the facility and that the licensee designate individuals, who are licensed as senior operators pursuant to Part 55, to be responsible for directing the licensed activities of licensed operators. Paragraph 10 CFR 55.53(e) requires that if a licensee (individual licensed operator or senior operator) has not been actively performing the functions of an operator or senior operator, the licensee may not resume activities authorized by a license except as permitted by paragraph (f). To maintain active status, the licensee is required to actively perform the functions of an operator or senior operator on a minimum of seven 8-hour or five 12-hour shifts per calendar quarter. Paragraph 10 CFR 55.53(f) requires that if paragraph (e) is not met, before resumption of functions authorized by a license under that part, an authorized representative of the facility licensee is to certify that the qualifications and status of the license are current and valid and that the licensee has completed a minimum of 40 hours of shift functions under the direction of an operator or senior operator as appropriate to the position to which the individual will be assigned. The instances described above are considered examples of a violation of 10 CFR 50.54(k) or (l), as appropriate, in that reactor operators and senior reactor operators performed licensed duties without either maintaining their licenses in an active status required by 10 CFR 55.53(e) or completing the required number of hours of shift functions under the direction of an appropriate operator or senior operator required by 10 CFR 55.53(f) (50-373/97006-02; 50-374/97006-02). This licensee-identified and corrected violation is being treated as a Non-Cited Violation, consistent with Section VII.B.1 of the NRC Enforcement Policy.

In the instance involving the Shift Manager, minimum shift staffing requirements were not met and is considered a violation of Technical Specification 6.1.C which requires a minimum of one shift supervisor (Shift Manager) with an SRO licensee be assigned to the Units (50-373/97006-03; 50-374/97006-03). In the other instances, minimum shift staffing requirements for licensed positions were met due to the licensee normally implementing optimum shift manning as delineated in LAP-1600-2, "Conduct of Operations," Revision 51. This procedure assigned additional NSOs and SROs to each shift above the minimum shift staffing required by the Technical Specifications. This licensee-identified and corrected violation is being treated as a Non-Cited Violation, consistent with Section VII.B.1 of the NRC Enforcement Policy.

c. Conclusions

The licensee identified a violation (non-cited) involving a reactor operator and several senior reactor operators performing licensed duties with inactive licenses due to the licensee's mis-interpretation of what constitutes "performing the functions of an operator or senior operator" in maintaining an active license. In one

instance, the licensee failed to maintain the Technical Specification-required minimum control room staffing level, which was considered a non-cited violation.

## II. Maintenance

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

#### **M2.1 Cleaning and Lubricating Valves Prior to Stroke Time Testing**

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

The inspectors observed valve stroke time testing and interviewed an NSO, the mechanical maintenance supervisor responsible for the lubrication program, the inservice testing (IST) coordinator, and a maintenance superintendent. The inspectors also reviewed associated valve tests, completed work packages, operating and maintenance procedures, and programs including:

- LaSalle Operating Surveillance LOS-LP-Q3, "LPCS Valve Inservice Test for Cold Shutdown or Refuel Conditions," Revision 17
- LaSalle Technical Procedure LTP-600-4, "American Society of Mechanical Engineers (ASME) Section XI Inservice Testing of Pumps and Valves," Revision 14
- Work Request 970002748 01, Perform Stem Lubrication
- LaSalle Maintenance Surveillance LMS-GM-02, "Valve Stem Lubrication for Motor Operated Valves (MOV) - External Application (Limitorque Operators Only)," Revision 3

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

On April 17, 1997, the inspectors observed an NSO performing a portion of LOS-LP-Q3 for post-maintenance testing following maintenance. The inspectors observed the stroking of LPCS pump minimum flow valve, 1E12-F011, which had been cleaned and lubricated prior to the stroke time test. The valve stroked satisfactorily and met the stroke time acceptance criteria. In addition, the communication between the NSO who was controlling the valve testing and maintenance personnel at the valve was good.

The maintenance supervisor overseeing the valve lubricating program indicated that the predefined valve stem cleaning and lubrication activities were normally performed in conjunction with other scheduled procedures, including valve testing done to meet the ASME Pump and Valve Program requirements. This "bundling" of work was not performed to ensure that the valves would pass but instead to minimize the number of times plant equipment was operated. The IST coordinator determined that valve stem cleaning and lubrication was performed in conjunction with the scheduled stroke time testing for approximately 25 percent of the stroke time tests completed since January 1996.

The IST engineer indicated that his expectation was that the valve be stroked without work being performed on the valve that would affect the stroke time and that any maintenance that could affect the stroke time of the valve be indicated on the test documentation so the effect of the maintenance could be evaluated. Motor operated valve group personnel at LaSalle indicated that post-maintenance testing would not be required following stem and stem nut lubrication because the lubrication did not significantly affect the stroke time. The MOV group referenced MOV White Paper 135, "Generic Letter 89-10 Post Maintenance Verification Methods," Revision 0, which stated that there were no post maintenance test requirements following a stem or stem nut lubrication. In discussions with the inspector, MOV group personnel also indicated that any affect from cleaning and lubricating the stem prior to stroke timing would be minimal and would not constitute preconditioning. The inspector reviewed test results of valve stroke timing performed without lubricating and valve stroke timing immediately following cleaning and lubrication for several valves and no significant differences in the stroke times were identified.

c. Conclusions

While valve stems and stem nuts were cleaned and lubricated immediately prior to 25 percent of valve stroke time tests, this practice was due to efforts to accomplish more efficient work scheduling. The inspectors did not identify any specific intent by the licensee to perform the lubrication to ensure the valves would meet surveillance test acceptance criteria.

M2.2 Material Condition Issues Identified During Unit 1 Containment Inspection

a. Inspection Scope (71707)

On April 10, 1997, the inspectors toured the Unit 1 containment to assess the overall condition of the drywell and equipment in the drywell.

b. Observations and Findings

During the containment tour, the inspectors identified potentially broken pipe hangers and supports, and temporary alterations of plant equipment. In addition, the inspectors identified that the paint coating on a portion of the containment wall and floor was separating from the steel containment liner. The inspector also identified several light fixtures with missing or broken light bulbs, which indicated that the lighting in containment could be improved. The inspectors informed the licensee of the observations, however the observations had not been evaluated by the licensee at the conclusion of the inspection. None of the identified problems was an immediate safety concern, however further review of the significance of the problems will be performed by the inspectors after the licensee has completed their review. The review of the potential problems identified in the Unit 1 containment is considered an unresolved item (50-373/97006-04).

c. Conclusions

The Unit 1 primary containment contained material condition deficiencies which will be further assessed during a future inspection. The broken or missing lights and the housekeeping deficiencies indicated that the material condition and housekeeping of the Unit 1 containment could be improved.

M2.3 Check Valve Maintenance Program Problems

a. Inspection Scope (71707, 62707)

During a plant tour conducted on March 17, 1997, the inspectors identified a check valve that was leaking from its bonnet. The inspectors reviewed the maintenance history for the valve and the maintenance procedure used to repair the valve. In addition, the inspectors discussed issues related to the leaking check valve with maintenance and engineering personnel.

b. Observations and Findings

The inspectors identified that water was leaking from the bonnet of the reactor water cleanup (RWCU) filter/demineralizers inlet check valve, 1G33-F333. The leaking valve was not identified in and controlled by the licensee's problem identification form (PIF) or action request processes to ensure that it was repaired before the RWCU system was returned to service. The inspectors subsequently determined that the check valve maintenance procedure had been completed to repair the leak between the valve body and valve bonnet in accordance with an existing work package, but apparently the leak remained after the repair. Another work request existed to perform post-maintenance testing (PMT) of the check valve which directed a retorque of the bonnet bolts while the system was at operating temperature and pressure.

The inspectors were concerned that the established PMT would not provide an opportunity to identify the continued leakage problem until sometime after the system was at operating temperature and pressure. In addition, while providing for a hot retorque, the PMT did not ensure a leakage check would be simultaneously completed. The inspectors determined that the valve had been repaired several times in the past for a recurring bonnet leak and other problems, however the valve was not in the licensee's check valve program for increased problem trending and evaluation. Further review of the licensee's practices for check valve maintenance, including maintenance procedure adequacy, PMT practices, and the check valve program, is considered an unresolved item (50-373/97006-05; 50-374/97006-05).

c. Conclusions

Repair work on the RWCU filter/demineralizers inlet check valve was not effective in repairing a leak and resulted in rework. The established PMT would not necessarily identify a continued problem. The licensee had not increased focus on this valve despite a history of recurring problems.

### M3 Maintenance Procedures and Documentation

#### M3.1 Potential Problems with Investigations of Equipment Failures

##### a. Inspection Scope (62707)

The inspectors reviewed two instances involving deficient investigation of equipment failures by the licensee, resulting in subsequent failures of the equipment.

##### b. Observations and Findings

In the first instance, an auxiliary relay for the 0 emergency diesel generator (EDG) fuel oil transfer pump did not transfer from the primary power supply to the alternate power supply when the primary power supply was de-energized. The electrical maintenance and operations personnel evaluating the failure manipulated and actuated the relay during the licensee's initial investigation. The licensee subsequently replaced the relay after it had remained in service for seven days following the failure and identified that the relay was significantly damaged. Manipulation of the relay during the initial investigation hindered the identification of continued problems with the relay and as-found conditions that could aid in root cause analysis of the failure.

In the second instance, electrical maintenance personnel adjusted a power feed breaker trip setting for a temporary power supply for an MOV, stating in work documentation that "the extra run of temp cable was probably increasing current and caused the trip." The breaker failed to operate again two weeks later when the valve was cycled. The administrative process used to make the setpoint change to the plant was not clear to the inspectors.

Further review by the inspectors to determine the administrative process used by the licensee to change the breaker setting during the failure investigation and review of licensee policy, if any, regarding manipulation of equipment during failure investigations is an unresolved item (50/373-97006-06; 50-374/97006-06).

##### c. Conclusions

Deficient investigation of equipment failures by the licensee, resulted in subsequent failures of the equipment. Further review of the licensee's policy regarding troubleshooting of equipment problems will be addressed in future inspections.

**M4 Maintenance Staff Knowledge and Performance**

**M4.1 Electrical Maintenance Personnel Incorrectly Changed Surveillance Procedure**

a. Inspection Scope (62707)

During performance of LaSalle Electrical Surveillance (LES) RH-100, "Unit 1 RHR System Division 1 Relay Logic Functional Test," Revision 7, electricians did not receive the expected plant response. The license determined that electricians had not correctly followed the procedure. The inspectors reviewed the surveillance procedure, the licensee's root cause investigation report, and discussed the issue with maintenance personnel.

b. Observations and Findings

On April 1, 1997, during performance of relay logic testing in accordance with LES-RH-100, the lead electrician believed the procedure was incorrect. Therefore, the lead electrician changed the procedure, but did not use the formal review and approval process for revising procedures delineated in licensee administrative procedures. The informal change caused the electricians to perform the steps in a sequence that differed from the approved procedure. The electricians completed their shift and notified their supervisor that they performed the procedure differently than it was written. The supervisor reviewed the procedure to insure that the change made by the electricians did not impact the results of the portions of the procedure that were already performed. The supervisor did not review the procedure to determine what impact the change would have on subsequent procedure steps. A subsequent crew continued with the surveillance and did not receive the expected plant response. A relay de-energized instead of remaining energized. The electricians immediately stopped their work and informed their supervisor.

The licensee subsequently determined that performance of the procedure steps in a sequence different from the approved procedure caused the unexpected plant response. LaSalle Administrative Procedure LAP-199-40, "Procedure Use and Adherence Expectations," Revision 9, Section B.3, required procedure users to perform each step of continuous use procedures in the sequence specified. Section B.2 required that procedure users stop if the procedure could not be performed as written or the procedure was incorrect and have the procedure revised. The failure of the electricians to perform the steps of LES-RH-100, a continuous use procedure, in the specified sequence or have the procedure revised is an example of a violation of Technical Specification 6.2.A.a. (50-373/97006-01b; 50-374/97006-01b). Although the licensee identified this violation, a Notice of Violation is still being issued because it is one of several examples of the failure to follow procedure discussed in this report, indicating that previous licensee improvement efforts in this area have not been fully effective.

c. Conclusions

The licensee identified a violation involving the failure of electricians to follow licensee administrative requirements when the sequence of procedure steps for a relay logic test was changed. No adverse safety consequences resulted from conducting the relay testing in a sequence not specified in the procedure. However, the electricians' failure to follow administrative procedures for changing approved plant procedures indicated that plant personnel may not fully understand or appreciate LaSalle administrative requirements and management expectations for procedure compliance.

III. Engineering

**E2 Engineering Support of Facilities and Equipment**

**E2.1 Changes in Control Panel Mounting Not Documented**

a. Inspection Scope (71707)

The inspectors performed a routine inspection of the 1A and 1B RHR pump and heat exchanger rooms following realignment of the RHR system in the shutdown cooling (SDC) mode of operation.

b. Observations and Findings

On March 31, 1997, during an RHR system walkdown following realignment of SDC, the inspector identified that the Unit 1, Division 3, core standby cooling system (CSCS) heating, ventilation, and air conditioning (HVAC) control panel, 1PL32J, was missing the top two panel mounting bolts. The panel mounting tabs were in place and the holes for the studs had been drilled in the wall, but anchor bolts and nuts were not installed.

The operations Shift Manager determined the equipment to be inoperable, entered the component in the degraded equipment log, and initiated a PIF on April 1, 1997. He also contacted a system engineer to request an evaluation of equipment operability and reportability requirements related to the inoperable CSCS HVAC control panel. On April 3, 1997, the design engineering structural supervisor informed the Shift Manager that the upper portion of the panel was attached to the wall by two anchors located inside the panel and that engineering personnel had reviewed structural drawings and determined no operability concern existed.

On April 14, 1997, engineering personnel determined that assumptions made regarding the adequacy of the panel mounting on April 3, 1997, could not be supported. Although the anchors inside the panel had been visually verified to exist, these anchors were not reflected on applicable vendor drawings. During the previous review, the structural engineering supervisor had mistakenly assumed that outstanding field change requests (FCR) on the vendor design drawings would show

the internally mounted anchors. However, administrative personnel could not locate the FCRs which documented the changes to the mounting details and the seismic calculations necessary to support the changes. The licensee determined the as-built panel mounting did not match the approved vendor detail (Powers Regulator Report 5430-7387-7, page 6) and found that seven similar panels (2PL32J High Pressure Core Spray cubicle ventilation, 1/2PL33J RHR B/C cubicle ventilation, 1/2PL34J RHR A cubicle ventilation, 1/2PL35J LPCS cubicle ventilation) also differed slightly from the vendor approved details.

The Shift Manager determined the equipment to be operable based upon a judgement regarding the acceptability of the internally mounted anchors but requested support from the engineering department regarding seismic qualifications. Engineering department personnel completed a Concern Screening Form indicating that it was reasonable to expect that operability would be assured as a result of a more detailed evaluation. Engineering personnel subsequently completed the Attachment C of the Operability Assessment Process Form, as required by LAP-220-5, "Equipment Operability Determination," Revision 4, including calculations to seismically qualify the as-built panels' mounting configurations.

The licensee indicated that the changes in the mounting of the ventilation panels occurred during plant construction and proper documentation was either not generated or was lost. A failure to generate this design information would be a violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Controls," which requires that design control measures assure the design basis is correctly translated into the drawings and provide for verifying or checking the adequacy of design. An inability to retrieve the design records, including the FCRs and supporting seismic calculations, if they ever existed, would be a violation of 10 CFR Part 50, Appendix B, Criterion XVII, "Quality Assurance Records," which requires records to be identifiable and retrievable (50-373/97006-07; 50-374/97006-07). In either case, the criteria delineated in Section VII.B.2, "Violations Identified During Extended Shutdowns or Work Stoppages," of the NRC Enforcement Policy, is met for enforcement discretion, that is to refrain from issuing a Notice of Violation. Specifically, the licensee has entered an extended shutdown; enforcement action is not considered necessary to achieve remedial action; the violation is based upon activities of the licensee prior to the events leading to the shutdown; the violation would not be categorized at Severity Level I; the violation was not willful; the licensee's decision to restart the plant requires implicit NRC concurrence; and although the violation was not identified by the licensee, the violation meets the other criteria.

c. Conclusions

The inspectors identified a violation involving either the failure to incorporate the actual mounting configuration of some safety-related ventilation panels into design drawings and generate supporting seismic calculations during original plant construction, or the inability to retrieve the associated design documents. Due to the licensee's extended plant shutdown to address long-standing performance problems, the NRC is exercising enforcement discretion for this violation in

accordance with the NRC Enforcement Policy and a Notice of Violation is therefore not being issued.

Engineering personnel made an incorrect assumption with regard to an operability conclusion following inspector questions concerning mounting of a CSCS ventilation control panel. Engineering personnel placed insufficient emphasis on timely verification of that assumption.

**E8 Miscellaneous Engineering Issues**

**E8.1 Lockner-Moeller (K-M) 480 Volt Contact Failure**

**a. Inspection Scope (37551)**

The inspector reviewed a failure of a K-M relay. The inspector discussed the failure with plant personnel and reviewed the licensee's investigation of the relay failure.

**b. Observations and Findings**

On April 9, 1997, a K-M relay in the control circuit for the 0 EDG fuel transfer pump failed. The relay is part of the control circuit that automatically transfers the power source to the pump from one unit to the other unit if needed to maintain a continuous power supply. The relay is normally energized; however, when operators de-energized the Unit 1 power supply to the 0 EDG fuel oil transfer pump as part of a scheduled maintenance activity, the relay failed and did not transfer the power source from Unit 1 to Unit 2. The licensee determined, through subsequent inspection after replacing the relay, that the coil was cracked and discolored, a crystalline growth was identified on the relay, and one contact deteriorated to the point that it was broken.

In 1994, a K-M relay for the primary containment water chiller pump failed to operate and a failure analysis performed by the licensee indicated that crystals formed on the contacts which prevented the contacts from operating properly. Licensee corrective actions for the failure included a revision to equipment qualification (EQ) maintenance and program procedures to inspect the K-M relay for signs of coil deterioration. However, the K-M relay for the 0 EDG fuel oil transfer pump, an EQ relay located in the reactor building, was not subsequently included in the EQ program and was not inspected.

The licensee subsequently identified 800 safety-related K-M relays which may be susceptible to this type of failure and continued to develop an action plan to investigate the extent of the K-M relay problem and implement corrective actions. The failures of this type relay is considered an unresolved item pending inspector review to determine why the K-M relay for the 0 EDG fuel transfer pump had not been inspected by the licensee and the scope of the problem, including other relays among the 800 susceptible, that may not have been inspected (50-373/97006-08; 50/374-97005-08).

c. Conclusions

The licensee was taking actions to address K-M relay failures and additional NRC followup is planned.

- E8.2 (Closed) Unresolved Item 50-373/374-96020-04 Control room ventilation radiation monitor logic design change did not meet single failure criteria resulting in an unreviewed safety question. Inspectors determined this issue to be an apparent violation as described in Inspection Report 50-373/97003; 50-373/97003. Therefore, this issue will continue to be tracked through the apparent violation and this unresolved item is considered closed.

#### IV. Plant Support

R4 **Staff Knowledge and Performance in Radiological Protection & Chemistry (RP&C)**

R4.1 Improper Contamination Boundary Increases Possibility of Spread of Contamination to Clean Area

a. Inspection Scope (71750)

The inspectors toured several contamination and high radiation areas over the course of the inspection period to monitor radiation work practices.

b. Observations and Finding

On April 11, 1997, the inspectors identified contamination areas under the 2A moisture separator reheater (MSR) that extended over floor grating and were not covered to prevent contaminated material from passing through the grating. A potential existed to contaminate the floor below, which was not a contaminated area. The inspectors informed RP management.

Radiation protection technicians subsequently secured the area to prevent work until they could review their procedural requirements. On April 15, 1997, RP personnel determined that the grating in the contamination areas under the 2A MSR needed to be covered to prevent the spread of contamination. The licensee subsequently placed plastic over the grating in accordance with LaSalle Radiation Protection Procedure (LRP) 5721-6, "Construction of Radiologically Posted Areas and Step Off Pads Areas," Revision 1. Radiation protection technicians determined through contamination surveys of the floor below that no spread of contamination had occurred.

On April 24, 1997 the inspectors observed work being performed on the 2A MSR. The contamination area was located over grating and plastic had been installed to control the spread of contamination except for a 3 square foot area of grating. The opening provided the potential for contamination to spread to the floor area below

the grating that was not contaminated. The inspectors informed RP management and the licensee added plastic to cover the open grating.

The inspectors interviewed several RP technicians about the 2A MSR contamination areas and noted a similar lack of knowledge of the administrative requirements of LRP-5721-6. Step F.2.f of LRP-5721-6 required that if a contamination area was constructed over a floor grating, then plastic or cloth that can be washed was to be installed on the grating to prevent the spread of contamination from the contaminated area to the non-contaminated area below. The failure of an RP technician to cover the grating enclosed in a contamination area as required by LRP-5721-6 when establishing the contamination area is considered an example of a violation of Technical Specification 6.2.A.a. (50-373/97006-01c; 50-374/97006-01c).

c. Conclusions

The inspectors identified a violation involving a radiation protection technician's failure to properly establish a contamination area due to a lack of knowledge of administrative requirements in a radiation protection procedure. A grating in the area, open to the clean floor below, was not covered with plastic. Other radiation protection technicians demonstrated the same lack of knowledge during subsequent interviews with the inspectors.

F.2 Status of Fire Protection Facilities and Equipment

F2.1 Fire Impairment in Unit 1 Division 1 125 Volt Battery Room Not Identified

a. Inspection Scope (71707)

The inspectors performed inspection of the Unit 1 and Unit 2 125 V DC battery rooms.

b. Observations and Findings

On April 23, 1997, during an inspection of the Unit 1 and Unit 2 125 volt DC battery rooms, the inspector identified two penetrations, approximately 3/4 inch in diameter, through the interior block walls of the Unit 1 division 1 125 volt battery room. The inspector notified the fire protection group lead of the penetrations. The system engineer and group leader identified a third penetration during their inspections. The licensee initiated fire impairment number 1-97190, established an hourly fire watch, and initiated an action request to repair the holes. The licensee inspected the 12 remaining Unit 1 and Unit 2 auxiliary building battery rooms and observed no additional through wall holes.

The holes compromised the integrity of the fire barriers enclosing the battery rooms; however, these walls were not among those fire barriers required by Technical Specifications. The licensee determined the condition was not safety significant because the holes were small, there were no combustible materials

passing through the openings, automatic fire detection was installed on each side of the barrier, and the walls did not separate redundant equipment required for safe shutdown. The licensee determined at least one train of equipment required for safe shutdown was available.

The licensee determined the root cause of the openings was the failure to reinstall threaded rod assemblies used to secure battery grounding cables to the wall and/or the failure to fill openings following removal of the battery racks during battery replacement and rack modification (M-1-1-88-004) implemented in 1990. Engineering had not identified within the package that a fire barrier would be affected so no specific instructions were provided concerning impairments in the work documents.

The licensee determined that the system engineering group lead had questioned the 125 volt direct current (DC) system engineer about the holes early in 1997. The system engineer responsible for the 125 volt DC system was aware that the holes existed and knew the walls were fire rated at three hours. However, the system engineer assumed that the holes had been evaluated as acceptable during the design modification and did not inform the fire protection group or initiate a PIF.

c. Conclusions

The inspectors identified an impaired fire barrier in a 125 volt battery room. The licensee had closed a work package and associated modification in 1990 without returning the fire barrier to an acceptable status. A system engineer with knowledge of the fire barrier impairment in early 1997, assumed that the condition of the fire barrier had been evaluated as acceptable during the modification installation without verifying that this assumption was correct. As a result, the licensee did not take appropriate actions to address the impairment until the impairment was later identified by the inspectors. The licensee responded adequately once informed of the holes in the battery room walls. No violations of NRC requirements occurred since this fire barrier was not required by Technical Specifications.

## VI. Management Meetings

### X1 Exit Meeting Summary

The inspectors presented the results of these inspections to licensee management listed below at an exit meeting on May 16, 1997, and a subsequent exit meeting on May 30, 1997. 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.

## PARTIAL LIST OF PERSONS CONTACTED

### ComEd

- \*W. Subalusky, Site Vice President
- \*#F. Dacirno, Plant General Manager
- \*L. Guthrie, Unit 1 Plant Manager
- \*#S. Smith, Unit 2 Plant Manager
- \*J. McDonald, Site Quality Verification/Safety Assessment Manager
- \*A. Javorik, System Engineering Supervisor
- N. Hightower, Health Physics Supervisor
- \*#P. Barnes, Regulatory Assurance Supervisor

\* Present at exit meeting on May 16, 1997.

# Present at subsequent exit meeting on May 30, 1997.

### INSPECTION PROCEDURES USED

- |          |   |
|----------|---|
| IP 37551 | Onsite Engineering  |
| IP 40500 | Effectiveness of Licensee Controls in Identifying, Resolving, and Preventing Problems |
| IP 61726 | Surveillance Observation  |
| IP 62707 | Maintenance Observation   |
| IP 71707 | Plant Operations  |
| IP 71750 | Plant Support Activities  |

ITEMS OPENED, CLOSED, AND DISCUSSED

Open

50-373/374-97006-01a	VIO	Operator failure to notify RP department after shutdown cooling realignment
50-373/374-97006-01b	VIO	Electricians did not follow procedure use expectations procedure
50-373/374-97006-01c	VIO	RP personnel did not appropriately establish contamination area
50-373/374-97006-02	NCV	Operators performed licensed duties with inactive licenses
50-373/374-97006-03	NCV	Failure to meet minimum staffing requirements
50-373/97006-04	URI	Review potential material condition problems identified in drywell
50-373/374-97006-05	URI	Review check valve maintenance procedures, PMT, and potential check valve program deficiencies
50-373/374-97006-06	URI	Review licensee troubleshooting practices
50-373/374-97006-07	NCV	Failure to generate or inability to retrieve design information for ventilation panels' mounting configurations
50-373/374-97006-08	URI	Review of K-M relay failures

Discussed or Closed

URI 50-373/374-96020-04 Closed		Control room ventilation radiation monitor logic design change did not meet single failure criteria resulting in an unreviewed safety question.
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## LIST OF ACRONYMS USED

ASME	American Society of Mechanical Engineers
CSCS	Core Standby Cooling System
DRP	Division of Reactor Projects
EDG	Emergency Diesel Generator
EQ	Equipment Qualification
FCR	Field Change Requests
HVAC	Heating, Ventilation, and Air Conditioning
IM	Instrument Maintenance
IR	Inspection Report
IST	Inservice Testing
K-M	Klockner-Moeller
LAP	LaSalle Administrative Procedure
LES	LaSalle Electrical Surveillance
LIS	LaSalle Instrument Surveillance
LOP	LaSalle Operating Procedure
LOS	LaSalle Operating Surveillance
LPCS	Low Pressure Core Spray
LRP	LaSalle Radiation Protection Procedure
MOV	Motor Operated Valve
MSR	Moisture Separator/Reheater
NOV	Notice of Violation
NRC	Nuclear Regulatory Commission
NSO	Nuclear Station Operator
PIF	Problem Identification Form
PDR	NRC Public Document Room
PMT	Post-Maintenance Testing
RHR	Residual Heat Removal
RO	Reactor Operator
RP	Radiation Protection
RP&C	Radiological Protection and Chemistry
RWCU	Reactor Water Cleanup
SDC	Shutdown Cooling
SRO	Senior Reactor Operator
URI	Unresolved Item
VIO	Violation
WCC	Work Control Center