U.S. NUCLEAR REGULATORY COMMISSION

REGION III

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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:	November 21, 1998 - January 5, 1999
Inspectors:	M. Huber, Senior Resident Inspector J. Hansen, Resident Inspector R. Crane, Resident Inspector C. Mathews, Illinois Department of Nuclear Safety
Approved by:	Roger Lanksbury, Acting Chief Reactor Projects Branch 2

EXECUTIVE SUMMARY

LaSalle County Station, Units 1 and 2
NRC Inspection Report 50-373/98023(DRP); 50-374/98023(DRP)

This inspection report included aspects of licensee operations, maintenance, engineering and plant support. The report covers a 6-week period of inspection conducted by the resident staff.

Plant Operations

- Operators performed well during routine activities, and the shutdown and startup of Unit 1 for the planned outage. Operators effectively controlled activities and performed their duties in a deliberate manner. Management oversight in the control room and during Plant Operations Review Committee meetings was extensive. The operators actions to address equipment operability and enter the Technical Specifications in most instances (for exceptions, see Sections O1.3 and O1.4) were accurate and timely. (Section O1.1)

- In two instances, the licensee did not ensure that equipment problems that they identified during the Unit 1 shutdown for a planned outage were adequately resolved prior to the subsequent startup. In the first instance, due to a communications error between an operator and engineers, thrust bearing wear detector circuitry for a turbine reactor feedwater pump was not repaired. In the second instance, following isolation of a feedwater heater train during the shutdown, the licensee performed system tuning. However, the isolation occurred again during plant startup even though the operators placed the heaters in service at a higher power level. Both instances resulted in delays in the subsequent power ascension and indicated that additional management attention needed to be applied to emergent maintenance items to ensure that material condition problems at the station are promptly identified and adequately addressed. (Section O1.2)

- The licensee failed to initially respond correctly to the failure of a turbine stop valve (TSV) to fast close during testing. The licensee initially assumed that the failure was due to a faulty limit switch in the test circuitry and therefore did not consider the associated end-of- cycle recirculation pump trip (EOC-RPT) channel inoperable. However, there was insufficient basis to consider the limit switch as the cause versus other failure mechanisms which could impact the EOC-RPT function. After prompting by the inspectors, the licensee declared equipment inoperable but due to a misinterpretation of the Technical Specification did not initially trip the EOC-RPT channel as required by the applicable Technical Specification action statement. These errors had no safety significance because the action taken by the licensee (revising minimum critical power ratio limits) was more conservative than the missed Technical Specification action statement and the licensee later demonstrated through testing that their original assumption, a faulty limit switch, was correct. (Section O1.3)

- The inspectors identified that licensed operators incorrectly declared the high pressure core spray (HPCS) system operable without meeting the Technical Specification definition of operability contrary to an administrative procedure. Specifically, the HPCS system emergency power supply was not operable as required by the Technical Specification definition of operability. The safety significance was minimal since no actions were required by the relevant Technical Specification prior to the licensee returning the emergency power supply to service. This failure to follow procedure was a minor violation not subject to formal enforcement action. The licensee's corrective actions were appropriate. (Section O1.4)

- The inspectors performed a walk down of the standby liquid control system and did not identify any significant material condition or operability concerns. (Section O2.1)

Maintenance

- The licensee performed the maintenance activities observed by the inspectors in an acceptable manner. Maintenance personnel were knowledgeable of their tasks and followed procedures. Also, the licensee maintained a significant amount of management oversight during the planned outage. The Outage Control Center was continuously staffed by licensee management who addressed problems in a timely manner. (Section M1.1)

- The licensee developed adequate work packages, pre-staged equipment and tools, and implemented an accurate and aggressive work schedule which resulted in the timely completion of a control room and auxiliary equipment room ventilation damper modification. (Section M1.2)

Engineering

- Engineers performed the 0 emergency diesel generator testing and the Unit 1, Division I, battery service test discharge in an acceptable manner. The engineers were knowledgeable of the activities and followed the test procedures. The licensee completed the tests satisfactorily within the outage schedule. (Section E4.1)

- System engineering support to address the failure of a TSV to fast close (discussed above) was deficient in that engineers assumed a cause without sufficient basis, did not thoroughly consider the impact on the accident analysis, and did not involve reactor engineering personnel in a timely manner. In particular, the licensee was slow in evaluating the impact of a possible failed TSV disk dump valve on reactor protection system and EOC-RPT channel response time and operability. As a result, pertinent Technical Specification required actions (tripping of RPS and EOC-RPT instrument channels) were not taken in a timely manner. (Section E4.2)

- Reactor engineering personnel provided appropriate support for the TSV failure to fast close (discussed above) once they became involved in the issue, and as a result, the licensee eventually implemented appropriate actions. (Section E4.2)

Plant Support

- The response by radiation protection personnel to water ejected from an open valve body in the Unit 1 drywell was not initially thorough and resulted in a delayed realization of an increased noble gas concentration. (Section R4.1)

- The licensee's investigation of the radiological contamination and increased noble gas concentration in the Unit 1 drywell caused by water ejected from an open valve body was timely and the licensee's corrective actions were appropriate. (Section R4.1)

- The inspectors identified an individual in the radiologically posted area of the plant who was not wearing the electronic dosimetry required by plant procedures. The licensee's response was adequate and the safety consequences were minimal. The inspectors noted that the licensee had previously taken extensive actions which appeared effective in preventing individuals from entering the radiologically posted areas without the required electronic dosimetry. The inspectors considered this worker dosimetry problem a minor violation not subject to formal enforcement action. (Section R4.2)

Report Details

Summary of Plant Status

During this inspection period, the licensee maintained Unit 1 at or near full power until December 5, 1998, when Unit 1 was shut down for a planned maintenance and surveillance test outage. On December 11, 1998, the licensee completed the outage when the main generator was synchronized to the electrical grid. Unit 2 remained shut down for a refueling outage with all fuel removed from the reactor.

I. Operations

O1 Conduct of Operations

O1.1 Operations Performance During Planned Outage

a. Inspection Scope (71707)

The inspectors conducted frequent reviews of ongoing operations activities in the main control room and in the plant throughout the inspection period, including the 6-day planned maintenance and surveillance test outage. Observed activities during the outage included the unit shutdown, control rod withdrawal to reactor criticality, turbine/generator startup, and power ascension.

b. Observations and Findings

The inspectors observed that, overall, operators followed procedures, used good 3-way communications, and controlled plant evolutions during routine operations, a shut down of LaSalle Unit 1 for a planned maintenance and surveillance test outage, and a subsequent plant restart. Management oversight in the control room was effective. Operators remained cognizant of plant activities throughout the outage. Control room personnel performed activities in a controlled, methodical manner and communication between licensed operators and their supervision was clear and concise. Licensee oversight of startup activities was extensive and included 24-hour coverage by plant management and Nuclear Oversight personnel. The licensee completed the outage when the turbine generator was synchronized to the electrical grid on December 11, 1998.

At one point during the shutdown, operators were placing the shutdown cooling mode of the residual heat removal (RHR) system in operation and the shutdown cooling outboard containment isolation valve did not fully open. The unit supervisor entered the appropriate Technical Specification (TS) Limiting Condition for Operation (LCO) for both trains of shutdown cooling being inoperable. Operators manually opened the valve and entered the appropriate LCO for disabling the primary containment isolation function of that valve. During the shutdown, the licensee repaired the valve by adjusting a limit switch and subsequently tested the valve satisfactorily prior to reactor startup.

On December 30, 1998, while performing normally scheduled LaSalle Operating Surveillance (LOS)-RD-M1, "Scram Discharge Volume (SDV) Vent and Drain Valves Operability Check and Quarterly Stroke Time Testing," Revision 10, the licensee identified that one set of vent and drain valves failed to close. The operators declared the valves inoperable, entered the appropriate TS LCO and initiated actions to repair the valves. The licensee determined that the most likely cause of the vent and drain valves failing to close was a failure of the solenoid which supplied air to these valves. The licensee developed an action plan to replace the solenoid. The operators entered eight-hour TS LCO 3.1.3.1.e because all SDV vent and drain valves were inoperable while the solenoid replacement work was in progress. The licensee later satisfactorily tested the solenoid (See Section M1.1).

The inspectors also observed the Plant Operations Review Committee (PORC) meetings related to the readiness of the plant to start up after the planned outage. The PORC members focused on the problems identified during the outage that could impact restart and operating experience related to lessons-learned from previous plant startups. The PORC meeting agendas were extensive and the PORC members spent a significant amount of time discussing the various agenda items. Some action items resulted from the meeting and the PORC tasked personnel with addressing the items before restart. The PORC documented the items and addressed all the action items which could have impacted restart.

c. Conclusions

Operators performed well during routine activities, and the shutdown and startup of Unit 1 for the planned outage. Operators effectively controlled activities and performed their duties in a deliberate manner. Management oversight in the control room and during PORC meetings was extensive. The operators' actions to address equipment operability and enter the TSs in most instances were accurate and timely. (See Sections O1.3 and O1.4 for exceptions.)

O1.2 Equipment Problems During Shutdown Not Effectively Addressed Prior to Unit 1 Startup

a. Inspection Scope (71707, 62707)

The inspectors assessed the effectiveness of the licensee in addressing material condition problems experienced during the reactor shutdown for the planned outage.

b. Observations and Findings

Operations personnel were challenged by equipment problems during the reactor shutdown on December 4, 1998, for the planned maintenance and surveillance test outage. Specifically, as discussed above, the shutdown cooling outboard isolation valve did not indicate full open when placing the plant in the shutdown cooling mode of operation. In addition, the 1B turbine driven reactor feedwater pump (TDRFP) failed a portion of a surveillance test, and the 11C feedwater heater isolated due to a high water level in the heater during the shutdown. The shutdown cooling outboard isolation valve

was effectively repaired during the outage as discussed in Section O1.1. The other two conditions noted above were not effectively addressed prior to the Unit 1 startup and resulted in delays during the power ascension.

In the first instance, on December 4, 1998, operators tested the 1B TDRFP using LaSalle Operating Surveillance (LOS)-FW-SR1, "Turbine Feedwater Pump Surveillance," Revision 10. The test results indicated that the thrust bearing wear detector did not meet the acceptance criteria in the procedure. The operators who performed the test noted the unsatisfactory portion of the test on the appropriate surveillance test attachment but did not initiate an action request to address the problem. An operator discussed the unsatisfactory portion of the surveillance test with the cognizant system engineering personnel and believed that engineering personnel were going to initiate the action request. System engineering personnel stated that they understood that operations personnel would initiate the action request. Because of the ineffective communication between the operator and the system engineers, plant personnel did not initiate an action request and did not schedule corrective actions. On December 11, 1998, during the power ascension following reactor startup, operators again performed LOS-FW-SR1 and the thrust bearing wear detector did not meet the acceptance criteria in the procedure. The problem resulted in a delay in the power ascension because of the subsequent repairs on the 1B TDRFP thrust bearing wear detector circuitry.

In the second instance of equipment problems not effectively addressed during the shutdown, the "C" feedwater heater train isolated due to a high water level in the 11C heater. The high level resulted from the water level instabilities in the heaters at lower reactor power levels. During the reactor startup and power ascension on December 11, 1998, the "C" heater train isolated again due to high level in the 11C heater. The licensee again determined that operation of the heaters at low reactor power resulted in the level instability. The isolation of the heater during reactor shutdown occurred at approximately 10 percent reactor power. The licensee believed that the tuning of the heater level control system performed during the outage and delaying the placing of the heaters in service during reactor startup until approximately 20 percent power would preclude another isolation. The isolation experienced during startup occurred at approximately 20 percent reactor power and demonstrated that the heater level stability at that power would not support operation of the feedwater heaters. The licensee indicated that procedures would be changed to preclude operation of the heaters during startup or shutdown below 30 percent reactor power and stated that at this power level heater stability should be sufficient to support normal feedwater heater operation.

c. Conclusions

In two instances, the licensee did not ensure that equipment problems that they identified during the Unit 1 shutdown for a planned outage were adequately resolved prior to the Unit 1 startup. Both instances resulted in delays in power ascension following the completion of the outage and indicated that additional management attention needed to be applied to emergent maintenance items to ensure that material condition problems at the station are promptly identified and adequately addressed.

O1.3 Improper Actions Following Failure of a Main Turbine Stop Valve (TSV) to Fast Close During Testing

a. Inspection Scope (71707, 61726)

The inspectors reviewed actions taken by the licensee following the failure of the number four TSV to fast close during routine weekly surveillance testing. The inspectors reviewed the stop valve test, stop valve design drawings, applicable sections of the Updated Final Safety Analysis Report (UFSAR), and the applicable TS and bases. Also, the inspectors interviewed operations and engineering personnel.

b. Observations and Findings

On November 29, 1998, operators performed LOS-TG-W1, "Turbine Weekly Surveillances," Revision 25. From the results of the test, the operators determined that a TSV, 1B21-MSV-4, fully closed in slow speed but did not fast close during the last 10 percent of travel as designed. The operators tested the valve two additional times with identical results. Step A.1.5 of LOS-TG-W1 required the operators to contact system engineering to evaluate valve operability and justify continued operation if the TSV failed to operate properly. Section A.1 of the surveillance test was intended to demonstrate that the disk dump/fast closure portion of the trip system was functional. The fast closure function was important because it was required to ensure that adequate reactor core protection was provided in the event of a transient where the TSV would close.

The Shift Manager (SM) contacted system engineering personnel and reviewed TS 3.3.1, Reactor Protection System (RPS) Instrumentation, and 3.3.4.2, End-Of-Cycle Recirculation Pump Trip (EOC-RPT) System Instrumentation, since the RPS and EOC-RPT TSs were directly related to the fast closure function of the TSVs. With the assistance of system engineering, the SM determined that the RPS function would cause a scram and turbine overspeed protection would not be compromised by the failure of the TSV to fast close. The operators satisfactorily performed portions of LOS-RP-Q2 to verify the channel functional surveillance test requirements of TS 3.3.1 and 3.3.4.2.

System engineers postulated that the failure of the valve to fast close during the last 10 percent of travel was due to a failure in the test circuit devices and was not a hydraulic or mechanical valve problem that would impact the safety function. Operations personnel initiated a Problem Identification Form (PIF) and determined that the valve was operable but in a degraded status based upon the engineering assessment and functional testing performed. The SM concluded that the valve was operable and did not request an operability evaluation. Operators initiated an action request to repair the valve, completed a degraded equipment log entry for the TSV, and requested that engineering personnel identify and address any problems with valve operation during the next outage.

On November 30, 1998, the inspectors questioned the licensee as to the effect of a stuck disk dump valve, versus the previously postulated test circuit problem, on the ability of the TSV to fast close and what impact that would have on the response time

testing required by TS 3.3.1 and TS 3.3.4.2 for the RPS and EOC-RPT functions. Specifically, the bases for TS 3.3.4 indicated that the EOC-RPT system response time, which included a portion of the TSV stroke time, was assumed in the accident analysis. Also, Section 15.2.3.2 of the UFSAR assumed that the TSV response time was from initiation of valve motion. Operations department personnel initiated a PIF regarding the TSV response time and determined the TSV to be operable for EOC-RPT instrumentation and the accident analysis. Also, the operators requested that engineering personnel perform an operability evaluation to address potential problems resulting from a slow closure of the TSV.

Reactor engineering personnel subsequently determined that the transient analysis for feedwater controller failures or a turbine trip with no bypass valves would be impacted if the disk dump valve was not operating properly. Specifically, there would be a delay in the recirculation pump trip and the reactor scram that would be initiated from a TSV that was not closing at the correct speed during the transients. As a result, the licensee determined that TS 3.2.3, Minimum Critical Power Ratio (MCPR), was applicable to the failure of the TSV to fast close because the EOC-RPT channel could not meet the UFSAR accident analysis assumptions.

The licensee declared the EOC-RPT trip system (associated with the inoperable EOC-RPT channel) inoperable and entered TS LCO action statement 3.3.4.2.d.1 which required the licensee to increase the MCPR LCO to the EOC-RPT inoperable value. This was a conservative action in that only one channel was inoperable versus the entire trip system. However, the licensee failed to also enter TS LCO action statement 3.3.4.2.b for the one inoperable channel and trip that channel. Although ensuring the change in MCPR limits was a more conservative action and, from a technical standpoint, would alleviate the need for the EOC-RPT function, the failure to also trip the EOC-RPT channel was not consistent with TS requirements. (This was not a TS violation because as noted below the licensee later determined that the EOC-RPT channel was actually operable.) The licensee did not take action with respect to the RPS function at this time because the TS basis and UFSAR were not as clear with respect to the RPS response time requirements and the licensee continued to evaluate this aspect.

With regard to the MCPR requirements, the reactor engineers planned to document that a turbine control valve (TCV) slow closure, previously evaluated as within the transient analysis, bounded the slow closure of a TSV. The reactor engineers had compiled information regarding the operation of the TSV with the disk dump valve stuck closed following a turbine trip. A system engineer who performed the review initially understood that a TSV with a stuck disk dump valve would close quickly in the event of a turbine trip. However, following discussions with the valve manufacturer, the system engineer later informed the reactor engineers that the TSV would close very slowly, which invalidated the assumptions used by the reactor engineers to conclude that the TSV slow closure would be acceptable.

On December 2, 1998, after the reactor engineers identified that the TSV slow closure assumptions were not valid for the accident analysis, the licensee evaluated the reactor core thermal operating limits with the TSV slow closure. From the evaluation, the licensee concluded that the MCPR limit specified in the Core Operating Limits Report

(COLR) was not acceptable. The engineers determined that the TSV slow closure was not bounded by the TCV slow closure analysis and informed operations personnel that TS LCO action statement 3.2.3.b was applicable. When operating in a condition not specified in the COLR, the action statement for TS LCO 3.2.3.b required the licensee to reduce thermal power to less than 25 percent rated thermal power within 4 hours. As a result, operators entered the LCO action statement for a single, inoperable EOC-RPT channel, versus the inoperable trip system they had previously considered, and tripped the channel. The licensee also tripped the RPS channels associated with the TSV.

Subsequently, the licensee demonstrated through testing that a limit switch in the test circuitry was broken and out of alignment and that the alternate disk dump valve operated satisfactorily. The limit switch only impacted the fast closure function during testing and would not have prevented the TSV from fast closing during actual accident conditions. The licensee repaired the limit switch and inspected the limit switch on the other valves during the planned outage. Also, the licensee determined that MCPR was not exceeded for the plant operating conditions at the time of the TSV failure.

As a result of the TSV problem, the licensee revised the surveillance test procedure, LOS-TG-W1, to provide TS LCO entry guidance following a TSV failure to fast close. The inspectors reviewed the procedure changes and had no comments regarding the guidance provided for the TSVs.

c. Conclusions

Due to deficient engineering support, the licensee failed to initially respond correctly to the failure of a TSV to fast close during testing. The licensee initially assumed that the failure was due to a faulty limit switch in the test circuitry and therefore did not consider the associated EOC-RPT channel inoperable. However, there was insufficient basis to consider the limit switch as the cause versus other failure mechanisms which could impact the EOC-RPT function. After prompting by the inspectors, the licensee declared equipment inoperable but due to a misinterpretation of TS did not initially trip the EOC-RPT channel as required by the applicable TS action statement. These errors had no safety significance because the action taken by the licensee (revising MCPR limits) was more conservative than the missed TS action statement and the licensee later determined through testing that their original assumption, a faulty limit switch, was correct. (Additional conclusions regarding engineering support during this event are discussed in Section E4.2 of this report.)

O1.4 Incorrect High Pressure Core Spray (HPCS) Operability Determination

a. Inspection Scope (71707)

The inspectors reviewed the TS applicable to the HPCS system and the associated plant conditions when operators declared the system operable following planned maintenance.

b. Observations and Findings

On December 14, 1998, the licensee removed the HPCS system from service for planned maintenance on the associated area cooler and entered the appropriate TS LCO. On December 15, 1998, the licensee removed the 1B emergency diesel generator (EDG) from service for planned maintenance. The 1B EDG supplies the emergency source of power to the HPCS system.

On December 16, 1998, the inspectors determined that operators incorrectly concluded that the HPCS system was operable, as defined by the TS, prior to returning the 1B EDG to service. LaSalle Administrative Procedure (LAP)-200-3, "Conduct of Operations, Shift Operations," Revision 36, Section 24, required that a TS related system, subsystem, train, component, or device be considered inoperable when it is not capable of meeting all of the requirements of the TS definition for operability. The TS definition of operability required that both the normal and emergency power source to be capable of performing their related support function. The failure to consider the HPCS system inoperable was a violation of 10 CFR Part 50, Appendix B, Criterion V, which mandated that activities affecting quality be accomplished in accordance with documented procedures. However, the safety significance of the incorrect operability determination was minimal since the relevant HPCS TS LCO did not require that any actions be taken for approximately 12 days and the 1B EDG was declared operable three hours after the HPCS system was incorrectly declared operable. Therefore, the licensee's failure to follow the procedure in making the operability determination constituted a violation of minor significance and was not subject to formal enforcement action (Minor Violation (MV) 50-373/98023-01).

The licensee initiated corrective actions to address the problem which included issuing a memorandum emphasizing the need to ensure that operators comply with all TS LCO action statements and describing the circumstances surrounding the incorrect operability determination. In addition, the licensee indicated their intentions to investigate the cause of the incorrect determination and develop long-term corrective actions.

c. Conclusions

Licensed operators incorrectly declared the HPCS system operable without meeting the TS definition of operability contrary to an administrative procedure. Specifically, the HPCS system emergency power supply was not operable as required by the TS definition of operability. The safety significance was minimal since no actions were required by the relevant TS LCO prior to the licensee returning the emergency power supply to service. This failure to follow procedure was a minor violation not subject to formal enforcement action. The licensee's corrective actions were appropriate.

O2 Operational Status of Facilities and Equipment

O2.1 Engineered Safety Feature System Walkdown (71707)

a. Inspection Scope

The inspectors performed a walkdown of accessible portions of the safety-related Unit 1 and Unit 2 standby liquid control (SLC) systems to assess the system material condition, equipment operability, and conformance with the design basis. The SLC system was included on the list of key equipment based on risk achievement worth (RAW) as specified in the LaSalle Probabilistic Risk Assessment (PRA).

b. Observations and Findings

The inspectors found the system material condition to be acceptable. Equipment required for operability was found to be in conformance with design basis documentation. The inspectors brought minor discrepancies to the licensee's attention and the licensee dispositioned the discrepancies appropriately.

c. Conclusions

The inspectors performed a walk down of the standby liquid control system and did not identify any significant material condition or operability concerns.

II. Maintenance

M1 Conduct of Maintenance

M1.1 General Comments

a. Inspection Scope (61726, 62707)

The inspectors reviewed actions completed by the licensee following the failure of SDV vent and drain valves to cycle during a routine monthly surveillance. The inspectors observed maintenance activities and interviewed operations and maintenance personnel. Also, the inspectors observed portions of the following activities performed by maintenance personnel.

- "Reassemble Reactor Core Isolation Cooling (RCIC) Inboard Steam Isolation Valve," WR 980127194
- "Troubleshoot/Repair Cause of Valves to Cycle," WR 980135775
- "125 VDC Battery High Discharge Alarm Time Delay," DCP 9800238

In addition, the inspectors observed the licensee's performance during the planned outage which occurred during the inspection period by attending numerous outage status meetings.

b. Observations and Findings

In general, work packages were available to the maintenance personnel and in use at all activities observed. Also, maintenance personnel performing the work were knowledgeable of the tasks and governing procedures. The inspectors toured areas in the vicinity of work activities in the Unit 2 reactor building and observed an overall decline in the cleanliness and housekeeping. Senior station management acknowledged the inspectors assessment and indicated that additional management attention would be placed on maintaining work locations clean and free of debris.

The licensee maintained an Outage Control Center (OCC) during the planned maintenance and surveillance test outage from December 5, 1998, through December 11, 1998. The OCC was staffed on a 24-hour basis during the entire outage to ensure that problems were identified and resolved in a timely manner. Senior station management was also onsite for the entire outage to ensure that problems were addressed with the appropriate priority. The licensee implemented an outage plan that was developed prior to the start of the outage and established performance goals for the work. Goals were established for the number of lost time accidents, cumulative radiation dose, quality of preparation work, and number of configuration control events. Most of the licensee's outage goals were met and no safety-significant problems occurred.

On December 30, 1998, the licensee performed LOS-RD-M1, "Scram Discharge Volume Vent and Drain Valves Operability Check and Quarterly Stroke Time Testing," Revision 10, and identified that one set of vent and drain valves failed to close. The operators declared the valves inoperable, entered the appropriate TS LCO and initiated actions to repair the valve. The licensee determined that the most likely cause of the failure was the failure of the solenoid which supplied air to the two vent and drain valves and developed an action plan to repair the solenoid. Maintenance personnel planned the maintenance activity, staged equipment to support the solenoid replacement, and ensured that all support groups were prepared for the activity. The licensee replaced and satisfactorily tested the solenoid.

c. Conclusions

The licensee performed the maintenance activities observed by the inspectors in an acceptable manner. Maintenance personnel were knowledgeable of their tasks and followed procedures. Also, the licensee maintained a significant amount of management oversight during the planned outage. The OCC was continuously staffed by licensee management who addressed problems in a timely manner.

M1.2 Implementation of the Control Room and Auxiliary Electric Room Ventilation (VC & VE) Modification

a. Inspection Scope (62707)

The inspectors reviewed the licensee's installation of Unit 1 VC/VE backdraft dampers. The inspectors reviewed Design Change Package 9800195, the installation and testing schedule, and several work packages initiated to implement the design change. The inspectors also interviewed engineering, operations, and scheduling personnel.

b. Observations and Findings

The licensee planned to perform modifications on the B train of VC and VE heating, ventilation, and air conditioning (HVAC) system. The operators determined that the modifications would require that the system be inoperable. The operators appropriately determined that TS LCO 3.7.2 would be entered during the time the B train was inoperable and would require that the B train be returned to service within seven days. The backdraft damper modification work activity action plan indicated that the A train of VC and VE would remain in service as required by the LCO. However, on November 26, 1998, following the return to service of the A train of VC and VE from a maintenance outage, the licensee determined that the a solenoid valve on the A train VE compressor failed and planned to implement a temporary modification to allow the system to operate in the degraded condition.

The inspectors questioned operations department management on the reliability of the A train of VC and VE with the planned B train outage to start on November 28, 1998. The licensee would be required to shut down Unit 1 in accordance with TS 3.0.3 should the A train of VC and VE fail with the B train inoperable. Following discussions with the HVAC vendor, the licensee delayed the start of the B train modification, repaired the primary solenoid on the A train, and operated the A train for 48 hours to ensure its reliability.

The inspectors determined that the work packages were complete and that equipment was staged to support timely performance of the work activities. The licensee tested each damper to identify and repair clearance problems prior to removing the system from service. Also, the inspectors reviewed the Safety Evaluation for the modification and had no questions. The licensee completed the modification, performed required testing, and declared the system operable within the required TS LCO.

c. Conclusions

The licensee developed adequate work packages, pre-staged equipment and tools, and implemented an accurate and aggressive work schedule which resulted in the timely completion of the backdraft damper modification.

M2 Maintenance and Material Condition of Facilities and Equipment

M2.1 Valve Wiring Error

a. Inspection Scope (62707)

The inspectors reviewed the circumstances related to problems with a reactor recirculation (RR) flow control valve (FCV) on Unit 1. The inspectors reviewed PIFs, work requests, post-maintenance testing (PMT) procedures, engineering documentation, and other related documents. Also, the inspectors discussed the wiring error with plant personnel.

b. Observations and Findings

On November 25, 1998, the 1A RR FCV moved from 87.5 percent to 95 percent open while maintenance and operations personnel were investigating problems with the valve. Reactor power increased slightly due to the increase in the recirculation flow when the valve opened. Operators responded to the flow increase by closing the valve to its original position of 87.5 percent open. The licensee developed a troubleshooting plan and identified that the solenoid valve on the hydraulic power unit (HPU) was incorrectly wired. The licensee recently modified a solenoid valve on the HPU for the 1A RR FCV. However, the associated post-maintenance testing did not identify that the valve would operate properly after the solenoid valve replacement. The licensee was investigating the issue associated with the PMT that was performed. The inspectors review of the licensee's investigation of the issue associated with the PMT of the solenoid valve on the HPU is an Inspector Followup Item (IFI) (50-373/98023-02).

c. Conclusions

The FCV maintenance performed on the 1A RR FCV was not performed correctly and resulted in a small power excursion as well as rework. The inspectors will continue to review potential issues with the valve PMT.

III. Engineering

E4 Engineering Staff Knowledge and Performance

E4.1 Outage Surveillances Performed by Engineering Personnel

a. Inspection Scope (61726, 37551)

The inspectors observed the performance of LaSalle Technical Surveillance (LTS)-800-7, "0 Diesel Generator Trips and Trip Bypass Logic Test," Revision 13, and LTS-700-6, "Unit 1 Division I Battery Service Test Discharge," Revision 16. In addition, the inspectors reviewed the associated completed test documentation. The inspectors chose to observe both surveillance tests because of the high relative safety significance of the emergency diesel generator (EDG) and the direct

current (DC) divisional electrical distributional system. These systems include two of the top three key systems as measured by RAW in the LaSalle PRA.

b. Observations and Findings

The inspectors did not observe any deficiencies in the performance of the Unit 1 Division I Battery Service Test Discharge. The test was performed in accordance with the outage schedule and the engineers and operators adhered to the test procedure.

Overall, the diesel generator trips and trip bypass logic test was performed in accordance with LTS-800-7 and the inspectors observed that the personnel involved in the test were knowledgeable of the test precautions, limitations, and expected plant responses. However, the inspectors identified that the test director, who was present in the EDG room, did not have the dosimetry which was required in that area of the plant (See Section R4.1). The licensee's testing personnel identified two material condition deficiencies during the performance of the testing and generated appropriate action requests. The first deficiency was a time delay relay which the engineers found out of calibration. The second deficiency was a time delay relay with a timer that wasn't working properly. The licensee verified that in both instances the EDG operability was not affected. Test requirements were satisfactorily met following completion of the maintenance items identified during the test.

c. Conclusions

Engineers performed the 0 EDG testing and the Unit 1 Division I battery service test discharge in an acceptable manner. The engineers were knowledgeable of the activities and followed the test procedures. The licensee satisfactorily completed the tests within the outage schedule.

E4.2 Engineering Personnel Support of Turbine Stop Valve Failure to Fast Close

a. Inspection Scope (61726, 37551)

The inspectors reviewed aspects of the failure of the number four TSV to fast close during routine weekly surveillance testing specifically related to support to operations provided by engineering. The inspectors reviewed the stop valve design drawings, applicable sections of the UFSAR, and a transient evaluation related to one TSV which operated slowly. Also, the inspectors interviewed engineering personnel.

b. Observations and Findings

On November 29, 1998, during performance of LOS-TG-W1, "Turbine Weekly Surveillances," Revision 25, the operators determined that 1B21-MSV-4, TSV number four, fully closed in slow speed but did not fast close during the last 10 percent of travel as designed. The licensee's response to this failure is described in detail in Section O1.3 of this report. The inspectors noted the following aspects regarding engineering support during the licensee's response:

- System engineering support provided to operations personnel in making the prompt operability assessment was deficient. The engineers concluded that the probable cause of the TSV failure to fast close was a failure in the test circuitry which would not impact the EOC-RPT function. The engineers narrowly focused on the fact that there were no failures of the dump valve or test circuitry in the past several years. The engineers did not thoroughly consider other possible causes which could impact the safety function. The engineers also did not review the impact of TSV failure on the accident analysis or involve the reactor engineers in the issue until questioned by the inspectors and approximately two days following the initial prompt operability assessment. As a result, the licensee was slow in evaluating the impact of a possible failed disk dump valve on RPS and EOC-RPT channel response time and operability.

- Reactor engineering personnel provided appropriate support once they became involved in the issue. The engineers correctly determined that the transient analysis for feedwater controller failures or a turbine trip with no bypass valves would be impacted if the disk dump valve was not operating properly and ensured the failure was bounded by an existing analysis. After being informed by system engineering personnel that the system engineer had provided an incorrect assumption regarding TSV closure time with an inoperable disk dump valve, the reactor engineers revised their previous analysis, determined that the failure was not bounded, and informed operating personnel so appropriate actions could be taken.

c. Conclusions

System engineering support to address a failure of a TSV to fast close during testing was deficient in that engineers assumed a cause without sufficient basis, did not thoroughly consider the impact on the accident analysis, and did not involve reactor engineering personnel in a timely manner. In particular, the licensee was slow in evaluating the impact of a possible failed TSV disk dump valve on RPS and EOC-RPT channel response time and operability. As a result, pertinent TS required actions were not taken in a timely manner. Reactor engineering personnel provided appropriate support once they became involved in the issue and as a result, appropriate actions were eventually implemented.

IV. Plant Support

R4 Staff Knowledge and Performance in RP&C

R4.1 Response to Noble Gas Concentration Increase in Drywell

a. Inspection Scope (71750)

The inspectors reviewed the circumstances surrounding increased concentrations of noble gases in the drywell during the planned outage.

b. Observations and Findings

On December 7, 1998, radioactive contamination was spread within the drywell when water was ejected from a Unit 1 valve body that was open for maintenance. The contamination levels at the area surrounding the valve were approximately 400,000 disintegrations per minute (DPM) per square centimeter (cm^2). The licensee took appropriate actions to identify the extent of the contamination and initiated an investigation to determine the source of the contaminated water. The investigation by the licensee was timely and corrective actions were appropriate.

The licensee determined that, when the operators switched the shutdown cooling system from the A train to the B train, level perturbations caused a pressure change within the vessel which resulted in water being expelled from the open valve bonnet. The licensee had previously removed the bonnet and internals to support maintenance on the valve. Mechanics had placed a cover over the open valve bonnet to ensure no foreign material would enter the system, but the cover was not intended to maintain a pressure boundary. In addition, the cover was a raincoat and not the steel cover that was recommended by the work package. The normal vent path, which consisted of the reactor head vent, was aligned to support the pressure change. However, the larger opening through the open valve bonnet allowed the pressure to vent through the valve bonnet instead of through the reactor head vent. Workers at the valve observed the cover blow off the valve and immediately contacted a radiation protection technician (RPT).

Following the event, work continued in the drywell for approximately 2 hours until radiation protection (RP) personnel recognized a problem with increased noble gas concentrations. Subsequently, RP personnel evacuated workers from the drywell and secured the drywell by closing the access hatch door. The licensee also identified that no continuous air monitors were in service in the area during the maintenance activities. In addition, RP personnel did not evaluate the potential airborne radioactivity when the RCIC valve was disassembled. The licensee may not have fully considered the radiological impacts on workers performing work in the drywell during the planned outage. The adequacy of the radiological controls related to this issue will be addressed in Inspection Report 50-373/99005(DRS); 50-374/99005(DRS).

c. Conclusions

The licensee's investigation of the radiological contamination and increased noble gas concentration in the Unit 1 drywell caused by water ejected from an open valve body was timely and the licensee's corrective actions were appropriate. The response by RP personnel was not initially thorough and resulted in a delayed realization of the increased noble gas concentration. The adequacy of the radiological controls related to this issue will be addressed in an upcoming inspection.

R4.2 Required Dosimetry Not Worn in Radiologically Posted Area

a. Inspection Scope (71750)

The inspectors reviewed the licensee's actions following the inspectors identification that an individual did not have the required dosimetry while performing test director duties in the radiologically protected area.

b. Observations and Findings

During the performance of the 1B EDG trips and trip bypass logic test (see Section E4.1), the inspectors identified that the test director, who was present in the EDG room, did not have electronic dosimetry. However, personnel in the EDG room were required to wear electronic dosimetry as specified in LaSalle Radiation Protection Procedure (LRP)-5000-7, "Unescorted Access to and Conduct in Radiologically Posted Areas," Revision 6. The engineer's failure to wear the electronic dosimetry is a violation of TS 6.2.B which required station personnel to adhere to radiation control procedures. The engineer indicated that he failed to self-check and was distracted with his other responsibilities for the test activities. The licensee initiated corrective actions including remediation of the individual prior to allowing him to resume test director responsibilities. There were no safety consequences to this event since the areas the individual was in were all less than 1 millirem (mrem) per hour and the individuals total time in the radiologically posted area without the required dosimetry was less than one hour. The inspectors also noted that the licensee had previously taken extensive actions which appeared effective in preventing individuals from entering the radiologically posted areas without the required electronic dosimetry. This failure constitutes a violation of minor significance and is not subject to formal enforcement action (NCV 50-373/98023-03).

c. Conclusions

The inspectors identified an individual in the radiologically posted area of the plant who was not wearing the electronic dosimetry required by plant procedures. The licensee's response was adequate and the safety consequences were minimal. The inspectors noted that the licensee had previously taken extensive actions which appeared effective in preventing individuals from entering the radiologically posted areas without the required electronic dosimetry. The inspectors considered this worker dosimetry problem a minor violation not subject to formal enforcement action.

V. Management Meetings

X1 Exit Meeting Summary

The inspectors presented the results of these inspections to licensee management listed below at an exit meeting on January 5, 1999. The licensee acknowledged the findings presented. The inspectors asked the licensee if any materials examined during the inspection should be considered proprietary. The licensee identified none.

PARTIAL LIST OF PERSONS CONTACTED

ComEd

*J. Benjamin, Site Vice President
*T. O'Connor, Plant Manager
G. Campbell, Unit 1 Engineering Manager
W. Riffer, Nuclear Oversight Manager
*G. Heisterman, Unit 1 Maintenance Manager
*D. Farr, Unit 1 Operations Manager
*P. Barnes, Regulatory Assurance Manager
*R. Palmieri, System Engineering Supervisor
J. Pollock, Support Engineering Supervisor
E. Connell, Design Engineering Supervisor
D. Bowman, Chemistry Supervisor
*R. Stachniak, Nuclear Oversight Assessment Manager
R. McConnaughay, Shift Operations Superintendent

* Present at exit meeting on January 5, 1999.

INSPECTION PROCEDURES USED

IP 37551	Onsite Engineering
IP 61726	Surveillance Observation
IP 62707	Maintenance Observation
IP 71707	Plant Operations
IP 71750	Plant Support Activities

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-373/98023-01	MV	Failure to follow procedure for operability determination.
50-373/98023-02	IFI	Licensee PMT investigation results review.
50-373/98023-03	MV	Failure to follow radiation protection procedure by not wearing dosimetry.

Closed

50-373/98023-01	MV	Failure to follow procedure for operability determination.
50-373/98023-03	MV	Failure to follow radiation protection procedure by not wearing dosimetry.

Discussed

None

LIST OF ACRONYMS USED

cm^2	Square Centimeter
DC	Direct Current
DPM	Disintegrations Per Minute
DRP	Division of Reactor Projects
EDG	Emergency Diesel Generator
EOC-RPT	End-Of-Cycle Recirculation Pump Trip
FCV	Flow Control Valve
HPCS	High Pressure Core Spray
HPU	Hydraulic Power Unit
HVAC	Heating, Ventilation, and Air Conditioning
IDNS	Illinois Department of Nuclear Safety
IFI	Inspection Follow-up Item
LAP	LaSalle Administrative Procedure
LCO	Limiting Condition for Operation
LOS	LaSalle Operating Surveillance
LRP	LaSalle Radiation Protection
LTS	LaSalle Technical Surveillance
MCPR	Minimum Critical Power Ratio
mrem	Millirem
NRC	Nuclear Regulatory Commission
OCC	Outage Control Center
PDR	NRC Public Document Room
PIF	Problem Identification Form
PMT	Post-Maintenance Testing
PORC	Plant Operations Review Committee
PRA	Probabilistic Risk Assessment
RAW	Risk Achievement Worth
RCIC	Reactor Core Isolation Cooling
RHR	Residual Heat Removal
RP	Radiation Protection
RPS	Reactor Protection System
RPT	Radiation Protection Technician
RR	Reactor Recirculation
SDV	Scram Discharge Valve
SLC	Standby Liquid Control
SM	Shift Manager
TCV	Turbine Control Valve
TDRFP	Turbine Driven Reactor Feed Pump
TS	Technical Specification
TSV	Turbine Generator Stop Valve
UFSAR	Updated Final Safety Analysis Report
URI	Unresolved Item
VC	Control Room Ventilation
VE	Auxiliary Equipment Room Ventilation