

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

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Report No: 50-373/96010, 50-374/96010

Licensee: Commonwealth Edison Company

Facility: LaSalle County Station, Units 1 and 2

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

Dates: August 3 - September 13, 1996

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EXECUTIVE SUMMARY

LaSalle County Station, Units 1 and 2
NRC Inspection Report 50-373/96010; 50-374/96010(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 inspectors.

Plant Operations

- ComEd took good initiative to perform a review of their Technical Specification (TS) interpretations. However, they found that 17 of 43 interpretations were not fully compatible with the licensing or design basis of the plant. The licensee initiated corrective actions including upgrading their process for review and approval of TS interpretations.

Maintenance

- Materiel condition problems continued to challenge the operations, maintenance, and engineering organizations. Emergent equipment problems resulted in difficulties for the maintenance organization in accomplishing scheduled work. These problems challenged operations in that, in several cases, the plant was placed in short-duration limiting conditions for operations.

Engineering

- The conduct of root cause analyses for both the 0 diesel generator (DG) output breaker failure and reactor core isolation cooling (RCIC) rupture disc event were weak. In both cases, the root cause team made non-conservative recommendations to the plant operations review committee (PORC) regarding the operation of plant equipment. In one case, they recommended bypassing a protective relay on the DG. In the RCIC event, they recommended preconditioning the plant equipment. In both cases, PORC performed their function and did not approve the root cause team recommendations.

Report Details

Summary of Plant Status

Unit 1 operated at or near full power for the entire inspection period.

Unit 2 entered the period at 96% power, derated because of thermal limit concerns due to power suppression in the area of two previously identified leaking fuel assemblies. On August 18, 1996, main turbine control valve (TCV) #2 partially closed and then reopened. The valve position continued to oscillate. The decision was made to close the valve and limit power to 83%. The unit operated at the reduced power for the remainder of the period.

I. Operations

01 Conduct of Operations

01.1 General Comments (71707)

The inspectors conducted frequent reviews of ongoing plant operations. Walkdowns were performed in the main control room, emergency diesel generator rooms, auxiliary electrical equipment rooms, safety related pump rooms, the reactor building, and the turbine building. The inspectors also discussed plant status and pending evolutions with shift personnel in the control room.

01.2 Shift Operating Activities

a. Inspection Scope

On several occasions, the operating shift was required to respond to indications of equipment performance problems. For each event, the inspector reviewed the symptoms, causes and consequences, along with licensee response and decisionmaking.

On August 8, Operations identified that the lake makeup line was not supplying makeup water as designed. A search revealed a break in this 5-mile concrete supply pipe approximately a mile from its source at the Illinois river. Repairs to the makeup line were pursued on a high-priority basis, to ensure the absence of lake makeup would not impact adversely on the cooling lake, particularly on the capability to maintain level in the ultimate heat sink well above the necessary minimum.

On August 18, the #2 turbine control valve (TCV) on the Unit 2 main turbine unexpectedly closed. It immediately re-opened. Operations had done nothing to precipitate the erratic TCV behavior, so they immediately focused closely on this valve. Small oscillations continued to occur, leading to a decision to manually close the valve and keep it closed. This decision resulted in a need to reduce reactor power to about 83% of full power for the last several weeks of the plant

operating cycle leading up to a scheduled refueling outage. The decision provided protection from TCV-induced transients and was considered prudent by the inspectors.

The shared, "O" emergency diesel-generator was found to have a failed-open backwash valve during a routine operator round on September 6, 1996. This led operations to declare the diesel-generator inoperable and enter a 72-hour LCO. The inspector received the circumstances and found the licensee correctly applied the LCO.

On September 7, operations encountered difficulty in maintaining the required reactor building differential pressure. Prompt diagnosis of the problem indicated the control system was malfunctioning, so the operators decided to switch the ventilation system to manual control. The inspector noted good coordination with engineering in the installation of a temporary alteration to provide manual control capability. This restored differential pressure to the required level. In addition, the inspector verified that the correct LCO was applied.

b. Conclusions

Operations correctly diagnosed the problems encountered and applied the correct Limiting Condition for Operation or other prudent control to successfully overcome each difficulty. Coordination with maintenance and/or engineering was good.

01.3 Licensee Review of Technical Specification (TS) Clarifications

a. Inspection Scope (71707)

The inspectors reviewed the licensee's efforts to verify that the TS clarifications written by the licensee conform to the current licensing and design basis of the plant. The inspector discussed several of these clarifications with the licensee staff and attended the Plant Operations Review Committee (PORC) meeting which reviewed the issue.

b. Observations and Findings

ComEd assigned a review team to conduct a complete review of their TS clarifications. These clarifications were written interpretations provided to the control room personnel to assist in interpreting TSs.

There were a total of 43 TS clarifications. The review team determined that 17 of the TS clarifications were not compatible with the current licensing or design basis. Fourteen of the 43 clarifications were in accordance with the licensing and design basis; however, the safety evaluations associated with these clarifications had been performed several years ago and the quality was not in accordance with ComEd's current standards. As a result, the licensee decided to re-perform the 50.59 evaluations and have the PORC review the upgraded 50.59s. Seven of the 43 clarifications were determined to be valid; however, the licensee determined that these clarifications should be controlled via

other administrative methods such as in procedures. The safety evaluations for these clarifications will be reviewed by PORC as the clarifications are moved to other administrative controls. Five of the 43 were determined to be acceptable by the review team with respect to the licensing and design basis, and they had an appropriate safety evaluation. These five clarifications were retained with no further actions.

The problems with the TS clarifications were discussed at a PORC meeting on August 30, 1996. The PORC decided to cancel the 17 questionable clarifications and approve the five clarifications that the review team identified as meeting the design and licensing basis. The other clarifications and the upgraded safety evaluations will be reviewed by PORC at a later date. In addition to initiating corrective actions to address the immediate concerns identified by the TS interpretation reviews, the licensee initiated corrective actions to upgrade their process for review and approval of TS clarifications.

At the end of the inspection period, the licensee was reviewing the clarifications that were canceled to evaluate if there were any events involving these clarifications that were required to be reported in accordance with 10 CFR 50.72 and 50.73.

c. Conclusion

ComEd took good initiative to perform a review of their TS interpretations, and the review criteria and depth were of good quality. However, they found that 17 of 43 interpretations were not compatible with the licensing or design basis of the plant. The licensee has initiated corrective actions including upgrading their process for review and approval of TS interpretations. The licensee's initial review determined that a Licensee Event Report (LER) would be required. The inspectors will follow this issue through the LER.

II. Maintenance

M1 Conduct of Maintenance

The inspectors observed several maintenance and surveillance activities during this inspection period in accordance with inspection procedure 62703 and 61726.

M1.1 Routine Activities

a. Inspection Scope (62703, 61726)

The inspectors observed routine (typically, monthly) maintenance and surveillance activities as they were being performed or conducted in the plant and discussed the activities with the personnel performing them.

b. Observations and Findings

The routine surveillance of emergency diesel generator 1A was observed and reviewed against criteria established in the UFSAR, the technical specifications and the controlling test procedure. The personnel performing the test were closely following the test procedure. Communications and coordination among involved personnel were good. The test results met all the required criteria.

Surveillance testing of the Unit 1 standby gas Treatment system was observed in detail. The inspector reviewed the applicable procedure, technical specifications and UFSAR information and discussed system performance with personnel conducting the test. Knowledge and understanding of the involved personnel were good; the test was successfully completed in conformance to all specified performance criteria.

c Conclusions

Routine test activities were successfully performed in accordance with applicable controls by personnel who were knowledgeable and who coordinated their activities well. No significant problems were observed in the conduct of these activities.

M2 **Maintenance and Materiel Condition of Facilities and Equipment**

M2.1 Materiel Condition Continued to Impact Operation and Scheduled Work

a. Inspection Scope (71707, 62703)

The inspectors followed the daily scheduled work and emergent equipment problems to assess materiel condition.

b. Observations and Findings

As noted above, during this inspection, several equipment failures occurred which continued to challenge operations and affect the conduct of scheduled work.

For example, operations identified that there was a break in the lake makeup line on August 8, 1996. The lake makeup line is a 5-mile stretch of concrete pipe which connects the LaSalle cooling lake (ultimate heat sink) to the Illinois River. As a result of this failure, significant engineering and mechanical maintenance resources were diverted to repair the line. The licensee has experienced previous breaks of the lake makeup line. The inspectors periodically monitored the work activities associated with this job. The work was completed in good time to ensure the cooling lake and the ultimate heat sink always had more than adequate water level.

On September 6, 1996, the licensee identified, during a system walkdown, that the backwash valve on the 0 DG cooling water strainer had failed open with a potential stem to disc separation. The 0 DG was declared inoperable and a 72-hour Limiting Condition for Operation (LCO) was

entered. The resultant emergent work challenged the operations, maintenance, and engineering departments. The inspector observed work, monitored progress and schedule and followed return-to-service activities. Although challenging, the work was properly completed within the limits of the LCO.

On September 7, 1996, operations experienced problems with the reactor building differential pressure. A temporary alteration was installed to operate the reactor building ventilation manually such that troubleshooting could be done on the control system where the problem apparently originated. The problem was traced to a failed controller. This problem challenged operations by placing them in a 4-hour LCO for secondary containment and it also challenged the maintenance organization because of its emergent nature. The inspector reviewed the activity and the control system history, and found the work was completed properly and in compliance with LCO requirements.

c. Conclusion

Materiel condition problems continued to challenge the operations, maintenance, and engineering organizations. Emergent equipment problems were handled successfully, but they resulted in difficulties for the maintenance organization to accomplish scheduled work and caused the engineering organization to focus on reactive rather than proactive activities. These problems also challenged operations in that, in several cases, the plant was placed in short duration LCOs. In each case, LCO requirements were met.

III. Engineering

E1 Conduct of Engineering

E1.1 Engineering Root Cause Analysis of O DG Failure

a. Scope (37551)

The inspectors observed the troubleshooting activities for the O DG after the output breaker for Unit 1 failed to close during surveillance testing following maintenance. The inspectors also observed the root cause analysis effort.

b. Observations and Findings

On August 14, 1996, the O DG was being run in accordance with LOS-DG-M1, "O Diesel Generator Operability Test," Revision 31, when the output breaker failed to close on Unit 1. Operations personnel notified system engineering and maintenance of the problem.

The initial troubleshooting was not performed using the available procedure. The purpose of LTP-500-1, "Diesel Generator Output Breaker Troubleshooting Procedure," Revision 6, as stated in the procedure, is to determine the failure mode in the event that a DG output breaker

fails to close during its monthly operability surveillance. The system engineer and electrician did not use this procedure; instead they performed troubleshooting based on their personal knowledge using a controlled electrical print. The system engineer and electrician were unaware that LTP-500-1 existed. This failure to follow procedures is a violation of 10 CFR 50, Appendix B, Criterion V (VIO 373;374/96010-01).

As a result, the troubleshooting was not well documented. The next day most of the initial troubleshooting had to be re-performed because of the uncertainty of the tests that had already been conducted. At that time, there were only about 24 hours left of the 72-hour LCO.

While the troubleshooting was taking place, a root cause team assembled to assist in identifying the root cause. This team became narrowly focused on one component during the troubleshooting activities. The team was focused on the synchronization check (HACR) relay as the root cause, partly due to past equipment problems with this relay. This relay provides a protective function when paralleled with an outside source in that it requires the DG to be in-phase in order to close the output breaker.

The root cause team recommended jumpering out the relay even though there were spare calibrated relays onsite. Also, by early afternoon on August 15, troubleshooting had ruled out the possibility of a problem with the HACR relay. Even after troubleshooting ruled out the HACR relay as the cause, the root cause team took a procedure change to the PORC for approval. This procedure change allowed jumpering out the HACR relay. The PORC made the good decision to disapproved the proposed procedure change.

Further troubleshooting identified a failed component in the starting circuitry, specifically, the interposing relay. This component was replaced and the DG was tested satisfactorily.

c. Conclusions

The PORC decision was a good decision, because the root cause team did not present a valid reason for needing the procedure. In addition, it was viewed as a non-conservative action to bypass the DG's protective equipment.

E1.2 Engineering Root Cause Analysis of Reactor Core Isolation Cooling (RCIC) Rupture Disc Event

a. Scope (37551)

The inspectors reviewed the licensee's root cause analysis efforts, maintenance recovery efforts, and management involvement in the RCIC rupture disc event.

b. Observations and Findings

On August 19, 1996, while performing LOS-RI-Q5, "Reactor Core Isolation Cooling (RCIC) System Pump Operability, Valve Inservice Tests in Conditions 1, 2, 3, and Cold Quick Start," Revision 8, on Unit 1, the RCIC exhaust line rupture discs blew. No one was injured or contaminated. The licensee immediately began a root cause investigation.

The licensee determined that the most likely cause of the rupture disc failure was plugging of the steam drain line causing water to collect in the exhaust line and turbine casing. When RCIC was started for the monthly run, the water in the turbine casing was displaced downstream to the drain pot where this excessive water created a loop seal and overpressure condition. As a result, the rupture discs blew. The licensee determined that the most probable cause for the water in the exhaust drain line was a marginal drain line design such that the drain line was unable to pass expected corrosion products or foreign material. When the licensee inspected the drain line piping, they did not find any significant amount of corrosion products or foreign material. The licensee assumed the overpressure condition cleared any obstruction of the drain line.

Overall, the root cause effort was unorganized with weak management oversight. There was a disconnect between the root cause team, management, and the workers in the field. As a result of this disconnect, the root cause analysis and repair work did not proceed smoothly. Over 12 problem identification forms were generated during the repair of the rupture discs. On day 10 of the 14-day LCO, the Maintenance Superintendent stopped all work on RCIC because of the disorganization of the recovery efforts. Finally, the repair work was completed on day 13 of the 14 day LCO.

The root cause report was not final at the end of this inspection period. However, the inspectors attended the PORC meeting on August 30, 1996, where the root cause team presented their preliminary root cause and short term corrective actions. The root cause team presentation to PORC was largely administrative until the members of the PORC began asking detailed technical questions and challenging the conclusions of the root cause team. The root cause team was unable to answer many technical questions to support the bases for their conclusions. The root cause team was not completely forthcoming in their discussions; for example, when discussing the long term corrective actions from the previous RCIC rupture disc event in 1994, they were very non-specific about whether or not all the long term corrective actions had been implemented.

The root cause team's recommendations for immediate corrective actions were considered weak. One of the immediate corrective actions was to put a drain line on the drain pot such that the drain pot could be manually checked for water. The root cause team recommended only checking this drain line before and after scheduled RCIC runs. The

Operations Manager, a member of the PORC, quickly questioned the root cause team on the acceptability of this practice and whether it was preconditioning.

The root cause team did not view this as preconditioning as they felt the first action to take if water was found would be to declare RCIC inoperable. However, the PORC asked the root cause team to re-evaluate the frequency at which the drain line should be checked.

Another corrective action was to put a strainer in the drain line to catch any foreign material which could potentially clog the downstream orifice. The root cause team recommended that this strainer be checked every refueling cycle. However, they could not present any basis for this. The PORC asked that they also re-evaluate the frequency of this activity.

This PORC meeting lasted approximately 6 hours and the PORC members asked the root cause team to re-evaluate specific recommendations and reconvene the PORC to discuss specific actions. The PORC reconvened the next day, August 31, to discuss these issues; however, no one from the root cause team was at the PORC to present the additional information. The PORC relied on the system engineer to make the presentation although this was not his responsibility as he was not a member of the root cause team. The PORC members again asked technical questions which could not be answered. As a result, the PORC made decisions and solved the problems rather than maintaining an oversight function.

The inspectors will track the final corrective actions for the RCIC rupture disc event as an Unresolved Item (URI 373;374/96010-02). Items to be reviewed by the inspector prior to closure include:

- the final root cause report,
- work packages associated with the repair of the rupture disc, and
- implementation of corrective actions from the 1994 rupture disc event.

E1.3 Conclusions on the Conduct of Root Cause Analyses

The root cause analyses conducted for both the O DG and RCIC events were weak in that the root cause teams were either narrowly focused or unorganized. In both cases, the root cause team made non-conservative recommendations to the PORC regarding the operation of plant equipment. In one case, they recommend bypassing a protective relay on the DG. In the RCIC event, they recommended preconditioning plant equipment. In both cases, PORC performed their function and did not approve the root cause team recommendations.

IV. Plant Support

The inspectors reviewed plant support activities in accordance with inspection procedure 71750 as part of their daily inspections. These activities included verifying plant personnel were complying with radiological protection procedures, observing the ALARA principle, and generally knowledgeable of plant conditions. No problems were observed in the areas of radiation protection, security, or emergency preparedness.

V. Management Meetings

X1 Exit Meeting Summary

The inspectors presented the results of these inspections to ComEd management at an exit meeting on September 13, 1996. ComEd 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
*D. Ray, Station Manager
*L. Guthrie, Operations Manager
*A. Magnafici, Acting Maintenance Superintendent
R. Fairbank, System Engineering Supervisor
*P. Antonopoulos, Site Engineering Manager
D. Boone, Health Physics Supervisor
*R. Crawford, Work Control Superintendent
J. Burns, Regulatory Assurance Supervisor

* Present at exit meeting on September 13, 1996.

INSPECTION PROCEDURES USED

IP 37551 Onsite Engineering
IP 40500 Effectiveness of Licensee Controls in Identifying, Resolving, and Preventing Problems
IP 61726 Surveillance Observation
IP 62703 Maintenance Observation
IP 71707 Plant Operations
IP 71750 Plant Support Activities

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

373;374/96010-01 VIO Failure to follow a troubleshooting procedure
373;374/96010-02 URI Followup of the root cause of the RCIC rupture disc failure

LIST OF ACRONYMS USED

ALARA As Low As Reasonably Achievable
DG Diesel Generator
DRP Division of Reactor Projects
DRS Division of Reactor Safety
IDNS Illinois Department of Nuclear Safety
IR Inspection Report
IFI Inspection Follow-up Item
LCO Limiting Condition for Operation
LER Licensee Event Report
LOP LaSalle Operating Procedure
NRC Nuclear Regulatory Commission
PIF Problem Identification Form
PORC Plant Operations Review Committee
PDR NRC Public Document Room
RCIC Reactor Core Isolation Cooling System
TCV Turbine Control Valve
TS Technical Specification