

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Reports No. 50-295/89029(DRP); 50-304/89026(DRP)

Docket Nos. 50-295; 50-304

Licenses No. DPR-39; DPR-48

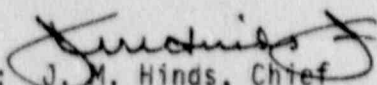
Licensee: Commonwealth Edison Company
P. O. Box 767
Chicago, IL 60690

Facility Name: Zion Nuclear Power Station, Units 1 and 2

Inspection At: Zion, Illinois

Inspection Conducted: August 31 through October 14, 1989

Inspectors: J. D. Smith
R. J. Leemon
A. M. Bongiovanni

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

OCT 27 1989

Date

Inspection Summary

Inspection from August 31 through October 14, 1989 (Reports No. 50-295/89029(DRP); 50-304/89026(DRP))

Areas Inspected: Routine, unannounced resident inspection of licensee action on previous inspection findings; summary of operations; failure of Unit 1 control rods to indicate fully inserted; breach of containment integrity; drainage from the refueling water storage tank (RWST); Unit 2 unusual event due to reactor coolant system leakage; operational safety verification and engineered safety feature (ESF) system walkdown; surveillance observation; maintenance observation; licensee event reports (LERs); evaluation of licensee performance; and training.

Results: Of the 10 areas inspected, no violations or deviations were identified.

DETAILS

1. Persons Contacted

- *T. Joyce, Station Manager
- *W. Kurth, Superintendent, Production
- *T. Rieck, Superintendent, Services
- P. LeBlond, Assistant Station Superintendent, Operations
- R. Johnson, Assistant Station Superintendent, Maintenance
- R. Budowle, Assistant Station Superintendent, Technical Services
- N. Valos, Unit 2 Operating Engineer
- W. Demos, Unit 1 Operating Engineer
- M. Carnahan, Unit 1 Operating Engineer
- E. Broccolo, Jr., Operating Engineer
- T. Vandevort, Quality Assurance Supervisor
- C. Schultz, Quality Control Supervisor
- W. Stone, Regulatory Assurance Supervisor
- W. T'Niemi, Technical Staff Supervisor
- R. Smith, Security Administrator
- *T. Saksefski, Regulatory Assurance
- *K. Moser, Opex Administrator

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- D. Calhoun, Project Inspector
- R. Landsman, Project Engineer

*Indicates persons present at the exit interview.

The inspectors also contacted other licensee personnel including members of the operating, maintenance, security, and engineering staff.

2. Licensee Actions on Previous Inspection Findings (92701, 92702)

NRC Region III management has reviewed the existing open items for the Zion station and have determined that the following open items, listed in Attachment A, will be closed administratively due to a lack of safety significance, age of the item, and other priority work. The licensee is reminded that commitments directly relating to these open items are the sole responsibility of the licensee and must be met as specified. NRC Region III will review licensee actions by periodically conducting a statistical sample of administratively closed items.

3. Summary of Operations (71707)

- a. Unit 1: The unit was placed on-line on August 31, 1989, after resetting the MSSV setpoints. On September 7, the unit was placed in Hot Shutdown in preparation for a refueling and on September 10, the unit was placed in Cold Shutdown to begin a 70 day refueling outage.

(1) Failure of control rods to indicate fully inserted.

On September 7, 1989, with the reactor at 0% power, Unit 1 control rods were tripped in preparation for a planned refueling outage. Two rod position indicators (RPIs) failed to indicate that rods were fully inserted. The indicator for rod location K-14 dropped 74 steps and remained at that value. The indicator for rod location P-10 dropped 20 steps, and drifted down to position zero over the following two hours. The unit operators proceeded with emergency boration per plant procedure to compensate for the potential loss of shutdown margin. The cause of the indication problem for K-14 was attributed to the fact that the signal conditioning module which was replaced in March 1989, was not accurately zeroed. To accurately calibrate the module, it would have been necessary to fully insert the associated control rod with the unit at power. In this case, the zero mark was estimated low causing the RPI to indicate 74 steps with the RPI fully inserted. The RPI for P-10 had drifted slightly since its last calibration which occurred at the beginning of the last refueling cycle.

(2) Breach of containment integrity due to AFW check valve work maintenance.

On September 21, 1989, at 1:30 p.m., it was identified that containment integrity was breached while fuel movement was in progress. Zion Technical Specifications do not require containment integrity during fuel movement; however, an onsite review dated February 3, 1978 states that "each penetration providing direct access from the containment atmosphere to the outside atmosphere shall be ...closed by an isolation valve or blank flanged". The auxiliary feedwater (AFW) check valves inside containment on the AFW header were removed for repair. The steam generator (S/G) atmospheric relief valves were opened to facilitate S/G draindown for sludge lancing. This provided a flow path from the containment atmosphere to the environment following this flow path: through the removed AFW check valve, the feed ring, through the S/G, the secondary side S/G, the S/G atmospheric relief valves, to the outside atmosphere. The containment was at a negative pressure so no actual release of containment atmosphere to the environment should have occurred.

The licensee isolated and administratively placed the S/G atmospheric relief valves out of service. The S/G PORV Isolation valves were closed to isolate the release path. The breach of containment integrity was caused by inadequate work planning in that work activities were authorized without fully evaluating the consequences.

(3) Drainage from the Refueling Water Storage Tank (RWST)

On October 1, 1989, at approximately 12:40 a.m., an inadvertent flow path was established from the RWST to the Unit 1 reactor

coolant system (RCS). At the time of the event, the reactor was defueled and the steam generators' (S/G) manways were opened for eddy current testing.

Tech staff personnel were performing special procedure (TSSP 109.89), which cycled the RHR system to the safety injection pump tie valve, 1MOV-S16804, this completed a flow path from the RWST through other open safety injection valves to the RCS which resulted in approximately 650 gallons of water to spill through the S/G manways. No personnel contamination occurred as a result of the spill. Appropriate decontamination actions were implemented for cleanup.

- b. Unit 2: The unit operated at power levels up to 100% until September 21, 1989, when the unit underwent another power reduction due to RCS unidentified leakage being greater than Technical Specification limits. The unit resumed load following on September 22 for the remainder of the inspection period.

Unusual Event due to Unit 2 reactor coolant system leakage

On September 21, 1989, at approximately 7:30 a.m., with Unit 2 at 99% power, reactor coolant system leakage increased to greater than 1 gpm. The control room operator promptly noted the resulting meter changes and trends, so an unusual event was declared at 8:15 a.m. The licensee reduced power to 40 percent to make a containment entry. The leakage was suspected to be a packing leak on the pressurizer spray valve; however, after a containment entry was made, it was determined that the leakage was from the pressurizer PORV block valve 2MOV-RC8000A which had been de-energized and closed. This leakage was collected in the pressurizer relief tank.

The licensee terminated the GSEP unusual event at 10:00 a.m., when it was determined that the source of the leakage was identified and that the leakage was less than the Technical Specification limit of 10 gpm. The licensee continued to work to further reduce the leakage. The packing was adjusted on the valve and the leakage was reduced to less than 1 gpm. The unit resumed load following on September 22, 1989.

No violations or deviations were identified.

4. Operational Safety Verification and Engineered Safety Features System Walkdown (71707 & 71710)

The inspectors observed control room operations, reviewed applicable logs and conducted discussions with control room operators from August 31 through October 14, 1989. During these discussions and observations, the inspectors ascertained that the operators were alert, cognizant of plant conditions, attentive to changes in those conditions, and took prompt action when appropriate. The inspectors verified the operability of selected emergency systems, reviewed tagout records and verified proper return to service of affected components. Tours of the Unit 1 containment, auxiliary and turbine buildings were conducted to observe

plant equipment conditions, including potential fire hazards, fluid leaks, and excessive vibrations and to verify that maintenance requests had been initiated for equipment in need of maintenance.

The inspectors by observation and direct interview verified that selected physical security activities were being implemented in accordance with the station security plan.

The inspectors observed plant housekeeping/cleanliness conditions and verified implementation of radiation protection controls. From August 31 to October 14, 1989, the inspectors walked down the accessible portions of the essential AC/DC electrical, service water, auxiliary feedwater, residual heat removal, safety injection and component cooling water systems to verify operability.

The following reviews and observations were conducted to verify that facility operations were in conformance with the requirements established under Technical Specifications, 10 CFR, and administrative procedures. The inspectors made the following observations:

- ° During the week of September 11-15, 1989, the Zion station requalification program was evaluated by Region III examiners as unsatisfactory. The major weakness identified was the failure of a crew to recognize an anticipated transient without trip (ATWS) condition following a dropped rod event. Other program weaknesses were identified in the areas of job performance measure (JPM) and written examinations. To ensure the continued safe operations of the units in spite of the unsatisfactory rating, the NRC examiners evaluated two additional crews on September 19. These crews were determined to be satisfactory using crew evaluation standards. The licensee assigned the individuals that failed the exam to non-licensed tasks pending successful completion of a remedial examination by NRC examiners scheduled in early November.
- ° On September 13, 1989, the 1B safety injection pump was placed out of service for an environmental qualification inspection. Later on September 14, it was realized that the station was in violation of Standing Order 89-07 which stated that while diesel generator '0' was inoperable, both SI systems must remain operable. No work was performed on the pump during this period and the pump was still capable of performing its function. The inspectors were concerned that this problem was not identified by the planning personnel.
- ° On September 22, 1989, NRC security inspections identified a degradation in a vital area barrier. The licensee took appropriate compensatory measures.
- ° The licensee has implemented interim fire watch posts in safety related areas to improve the control of transient combustibles. The licensee has established an hourly and continuous fire watch in the auxiliary and containment buildings, respectively during the Unit 1 outage.

- ° The licensee aggressively attempts to keep exposure as low as absolutely possible. This is accomplished by having ALARA meetings prior to potential high exposure activities. Photographs, plant drawings, video tapes, and experienced personnel are available to help identify potential problems in the field.

No violations or deviations were identified.

6. Monthly Surveillance Observation (61726)

The inspector observed Technical Specifications required surveillance testing on the auxiliary feedwater system and the emergency diesel generators. The inspector verified whether this testing was performed in accordance with adequate procedures, whether test instrumentation was calibrated, whether limiting conditions for operation were met, whether removal and restoration of the affected components were accomplished, and whether test results conformed with technical specifications and procedure requirements. The inspector also verified that test results were reviewed by personnel other than the individual directing the test, and whether any deficiencies identified during the testing were properly reviewed and resolved by appropriate management personnel.

The inspector also witnessed portions of the following test activities:

- PT-24 Unit to System Auxiliary Transformer Auto Feed Transfer Test
- MI-1 Draining the Reactor Coolant System for Refueling or Maintenance
- MI-6 Filling and Draining the Refueling Cavity and Draining the Fuel Transfer Canal

No violations or deviations were identified.

7. Monthly Maintenance Observation (62703)

Station maintenance activities on safety related systems and components were observed or reviewed to ascertain whether they were conducted in accordance with approved procedures, regulatory guides, industry codes or standards and in conformance with Technical Specifications. Consideration was given to: the limiting conditions for operation while components or systems were removed from service; approvals prior to initiating the work; use of approved procedures; functional testing and/or calibrations prior to returning components or systems to service; quality control records; personnel qualifications and training; certification of parts and materials; radiological and fire prevention controls. In addition, work requests were reviewed to determine status of outstanding jobs and to assure that priority is assigned to safety related equipment maintenance which may affect system performance.

Technical Specifications required surveillance testing on the reactor ventilation and containment isolation systems was reviewed or observed.

Consideration was given to: procedures; calibration of test instrumentation; limiting conditions for operation during testing; and removal and restoration of the affected components consideration also was given to whether test results conformed with technical specifications and procedure requirements; review of test results by personnel other than the individual directing the test; and correction of any deficiencies identified during the testing. PT-21, "Reactor Coolant System Leakage Surveillance" was reviewed and no problems were noted.

The following maintenance activities were observed or reviewed:

NWR Z84004 Replace spring pack on 2MOV-RC8000B

NWR Z84198 Calibration of 2LCV-IW02

NWR Z83816 1C CS pump failed to start during PT-10

With regards to NWR Z84004, it was determined that the spring pack installed on the valve on January 20, 1989, was not of the proper size due to an improper stores item (SI) number transfer. The documented SI number for the spring pack was appropriate for installation in 2MOV-RC8000B; however, the SI number was not correct for the spring pack. It was determined that the stores item number for noncompatible Limitorque Belleville spring pack assemblies for size SMB-00 were transferred from one SI number to another. It was unclear as to who authorized the transfers. The licensee reviewed past work on MOVs and concluded that this was the only spring pack installed after the transfer of the SI numbers.

Refueling maintenance outage - Unit 1

Refueling maintenance activities on safety related systems and components were observed or reviewed to ascertain whether they were conducted in accordance with approved procedures, regulatory guides, industry codes or standards and in conformance with Technical Specifications. Consideration was given to the control of contract work, involvement of quality assurance organizations, radiological control, personnel qualifications, functional testing and use of proper procedures.

The major items being performed this outage in addition to the reactor head work are EQ inspections on 4kV motors, seal replacement on the 1A RHR pumps, rotor replacement on the 1D reactor coolant pump (RCP), RCP seal replacements, auxiliary feedwater valve work and overhaul of the "0" diesel generator. Fourteen 480V switchgear breakers were inspected and the pole shafts were replaced to comply with NRC Bulletin 88-01, Defects in Westinghouse Circuit Breakers, which addressed failure of the pole shafts under normal operations. The licensee is also inspecting and testing environmentally qualified Rosemount transmitters to verify operability in response to Information Notice 89-42, Failure of Rosemount Models 1153 and 1154 Transmitters.

No violations or deviations were identified.

8. Licensee Event Reports (LERs) Followup (92700)

Through direct observations, discussions with licensee personnel, and review of records, the following event reports were reviewed to determine that reportability requirements were fulfilled, immediate corrective action was accomplished, and corrective action to prevent recurrence had been accomplished in accordance with Technical Specifications. The LER listed below are considered closed:

UNIT 1

<u>LER NO.</u>	<u>DESCRIPTION</u>
295/89011-LL	Inadvertent Engineered Safety Feature (ESF) Actuation during PT-10 Testing

On July 12, 1989, while performing PT-10, Safeguards Actuation, on Unit 1, several containment isolation valves were inadvertently actuated. The test switch for the actuation relay being tested was removed from the test position prior to resetting the Phase A isolation signal which caused the remaining relays for the division to energize. This event was caused by a step being performed out of sequence. The licensee immediately returned the test switch to the test position, reset the Phase A actuation relay, and repositioned the actuated valves. The test procedure is being revised to include extensive human factors engineering changes. This LER is considered closed.

In addition to the foregoing, the inspectors reviewed the licensee's Deviation Reports (DVRs) generated during the inspection period. This was done in an effort to monitor the conditions related to plant or personnel performance, potential trends, etc. DVRs were also reviewed to ensure that they were generated appropriately and dispositioned in a manner consistent with the applicable procedures and the QA manual. The following DVRs were reviewed:

UNIT 1

<u>DVR NO.</u>	<u>DESCRIPTION</u>
22-01-89-082	1MOV-CS0006 Failure to stroke
22-01-89-083	1C CS pump fail to start from PT-10
22-01-89-091	IVSW tank emergency level control out of calibration

UNIT 2

<u>DVR NO.</u>	<u>DESCRIPTION</u>
22-02-89-039	Safeguards Train A in test
22-02-89-062	IVSW tank normal makeup level control out of calibration

With regards to DVRs 22-01-89-091 and 22-02-89-062, both of the controllers to the valves were found to be scaled out of band. It is believed that an operator dialed the controllers out, in order to adjust the level in the isolation valve seal water (IVSW) tanks. These controllers are referred to as a "snap actuating" type controller which remains inactive until the setpoint is reached, after which the associated control valve will open. Adjustment to the controller will affect the calibration. The licensee plans to place a label on the controller housings directing personnel not to adjust the dial settings. A letter was issued to the training department requesting that level controller dial adjustment information be provided to the appropriate personnel. This is considered an Open Item pending the completion of the corrective actions (295/89029-01(DRP) and 304/89026-01(DRP)).

With regards to DVR 22-02-89-039, on September 12, 1989, while replacing the relay latch device BR7-A, the relay was inadvertently actuated and latched. This placed a portion of Safeguards Train A in test which temporarily inhibited the closure of the feedwater regulating valves. Train B was operable during this time. The cause of the event was the failure of technical staff and maintenance personnel to recognize that the installation of the latch device on relay BR7-A had the potential for actuating the relay. The licensee plans to revise procedure E005-1, "Repair or Replacement of Logic Relays" to insure that personnel are aware that latched on logic relays must either be installed with the relay removed from the system or with the latch device in its unlatched position.

No violations or deviations were identified.

9. Evaluation of Licensee Performance (35502)

A review of site operations from January through August 1989, was conducted to evaluate the performance of the licensee as it may require adjustment of the NRC inspection plan. The review included operational events and trends indicated by monthly status reports.

No violations or deviations were identified.

10. Training (41400)

During the inspection period, the inspectors reviewed abnormal events and unusual occurrences which may have resulted, in part, from training deficiencies. Selected events were evaluated to determine whether the classroom, simulator, or on-the-job training received before the event was sufficient to have either prevented the occurrence or to have mitigated its effects by recognition and proper operator action. Personnel qualifications were also evaluated. In addition, the inspectors determined whether lessons learned from the events were incorporated into the training program.

Events reviewed included the events discussed in this report. In addition, LERs were routinely evaluated for training impact.

The inspectors attended a training course on respirator qualification.

The inspectors attended a table top discussion in the area of emergency preparedness. The session simulated a loss of communication systems which included a loss of telephones and computers. Each participant discussed how the event would impact his/her emergency position and was critiqued by the other members. These sessions appear to be beneficial in familiarizing the staff with their functions.

No violations or deviations were identified.

11. Open Items

Open Items are matters which have been discussed with the licensee which will be reviewed further by the inspector and which involve some action on the part of the NRC or licensee or both. One Open Item disclosed during this inspection is discussed in Paragraph 8.

12. Management Meetings

Mr. H. J. Miller, Director, Division of Reactor Safety, and members of his staff met with Commonwealth Edison Company (CeCO) representatives in the Region III office on October 4, 1989. CeCO presented their analysis of the Zion Station requalification program effectiveness based on the results of the NRC requalification examinations administered the week of September 11, 1989. A Confirmatory Action Letter was issued to identify the salient points that require corrective measures by CeCO in the near term.

13. Exit Interview (30703)

The inspectors met with licensee representatives (denoted in Paragraph 1) throughout the inspection period and at the conclusion of the inspection on October 13, 1989, to summarize the scope and findings of the inspection activities. The licensee acknowledged the inspectors' comments. The inspectors also discussed the likely informational content of the inspection report with regard to documents or processes reviewed by the inspectors during the inspection. The licensee did not identify any such documents or processes as proprietary.

ATTACHMENT A

<u>REPORT NO.</u>	<u>ITEM TYPE</u>
295/85031-02	Open
295/85024-03	Open
295/86003-BB	Bulletin
295/86005-12	Open
295/86013-03	TMI
295/86013-06	TMI
295/86022-02	Open
295/86002-05	Open
295/86028-01	Unresolved
295/86028-03	Open
295/86031-02	Violation (4)
295/87012-GL	Generic Letter
295/87013-02	Violation (4)
295/87013-03	Violation (4)
295/87016-02	Unresolved
295/87016-03	Open
295/87017-01	Unresolved
295/87017-03	Violation (4)
295/87021-01	Unresolved
295/87024-01	Open
295/87026-01	Open
295/87028-02	Unresolved
295/87032-02	Unresolved
295/87044-1N	Information Notice
295/88003-GL	Generic Letter
295/88004-IL	Licensee Event Report
295/88004-LL	Licensee Event Report
295/88005-01	Open
295/88005-02	Unresolved
295/88005-03	Open
295/88005-GL	Generic Letter
295/88006-LL	Licensee Event Report
295/88009-01	Open
295/88009-03	Open
295/88009-05	Open
295/88010-BB	Bulletin
295/88011-GL	Generic Letter
295/88012-06	Open
295/88014-GL	Generic Letter
295/88019-01	Open
295/88019-05	Open
295/88020-LL	Licensee Event Report
295/88021-LL	Licensee Event Report
295/88023-01	Open
295/88023-02	Open
295/88023-03	Open
295/88024-LL	Licensee Event Report

<u>REPORT NO.</u>	<u>ITEM TYPE</u>
295/88046-IN	Information Notice
295/88051-IN	Information Notice
295/88055-IN	Information Notice
295/88067-IN	Information Notice
295/89001-LL	Licensee Event Report
295/89002-03	Open
295/89002-LL	Licensee Event Report
295/89003-LL	Licensee Event Report
295/89005-LL	Licensee Event Report
295/89008-01	Unresolved
295/89008-02	Unresolved
295/89099-01	Open
295/89099-02	Open
295/89099-03	Open
304/84012-05	Violation (4)
304/84026-02	Violation (4)
304/84026-03	Open
304/85004-01	Unresolved
304/85022-1L	Licensee Event Report
304/85032-03	Unresolved
304/85032-04	Open
304/86003-BB	Bulletin
304/86005-08	Open
304/86010-03	Violation (4)
304/86012-02	Open
304/86012-04	Open
304/86012-07	Unresolved
304/86020-01	Open
304/86020-03	Unresolved
304/86024-01	Unresolved
304/86024-02	Violation (4)
304/86028-01	Unresolved
304/86028-03	Open
304/87007-01	Violation (1)
304/87012-GL	Generic Letter
304/87018-03	Unresolved
304/87018-04	Unresolved
304/87018-06	Unresolved
304/87018-10	Unresolved
304/87019-01	Unresolved
304/87019-02	Unresolved
304/87025-01	Open
304/87029-02	Unresolved
304/87033-02	Unresolved
304/87033-IN	Information Notice
304/88002-1L	Licensee Event Report
304/88003-GL	Generic Letter
304/88005-GL	Generic Letter
304/88005-LL	License Event Report

<u>REPORT NO.</u>	<u>ITEM TYPE</u>
304/88006-01	Open
304/88006-02	Unresolved
304/88006-03	Open
304/88009-LL	Licensee Event Report
304/88010-02	Open
304/88010-BB	Bulletin
304/88011-GL	Generic Letter
304/88012-LL	Licensee Event Report
304/88013-02	Violation (4)
304/88013-03	Violation (4)
304/88013-05	Open
304/88013-LL	Licensee Event Report
304/88014-GL	Generic Letter
304/88014-LL	Licensee Event Report
304/88015-LL	Licensee Event Report
304/88016-LL	Licensee Event Report
304/88019-01	Open
304/88019-02	Unresolved
304/88019-03	Open
304/88019-08	Open
304/88023-01	Open
304/88023-05	Open
304/88046-IN	Information Notice
304/88051-IN	Information Notice
304/88055-IN	Information Notice
304/88067-IN	Information Notice
304/89002-05	Open
304/89005-LL	Licensee Event Report
304/89008-01	Unresolved
304/89099-01	Open
304/89099-02	Open
304/89099-03	Open