

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Reports No. 50-295/87036(DRP); 50-304/87037(DRP)

Docket Nos. 50-295; 50-304

Licenses No. DPR-39; DPR-48

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

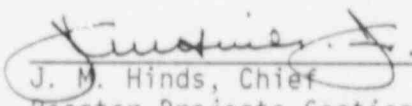
Facility Name: Zion Nuclear Power Station, Units 1 and 2

Inspection At: Zion, Illinois

Inspection Conducted: November 20, 1987 through January 14, 1988

Inspectors: M. M. Holzmer
P. L. Eng
B. A. Azab

Approved By:


J. M. Hinds, Chief
Reactor Projects Section 1A

01-27-88
Date

Inspection Summary

Inspection from November 20, 1987 through January 14, 1988
(Reports No. 50-295/87036(DRP); No. 50-304/87037(DRP))

Areas Inspected: Routine, unannounced resident and region-based inspection of licensee action on previous inspection findings; summary of operations; operational safety verification and engineered safety feature (ESF) system walkdown; surveillance observation; maintenance observation; licensee event reports (LERs); training; resident inspector followup on IEB 87-02; followup of regional requests.

Results: Of the nine areas inspected, no violations or deviations were identified in eight areas. One violation was identified in the remaining area; however, in accordance with 10 CFR 2, Appendix C, Section V.A, a Notice of Violation was not issued (failure to perform a surveillance - Paragraph 7). The violation was of minor safety significance and did not affect the public's health and safety.

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DETAILS

1. Persons Contacted

*G. Pliml, Station Manager
*T. Rieck, Superintendent, Services
*W. Kurth, Assistant Station Superintendent, Operations
*R. Johnson, Assistant Station Superintendent, Maintenance
J. Gilmore, Assistant Station Superintendent, Planning
R. Budowle, Assistant Station Superintendent, Technical Services
N. Valos, Unit 2 Operating Engineer
M. Carnahan, Unit 1 Operating Engineer
*R. Cascarano, Technical Staff Supervisor
*C. Schultz, Quality Control Supervisor
*W. Stone, Regulatory Assurance Supervisor
A. Bless, Regulatory Assurance Engineer
*R. Neely, Quality Assurance Engineer
*B. Soares, Inservice Inspection Group Leader

*Indicates persons present at the exit interview.

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

(Closed) Open Item (295/87020-01; 304/87021-01): Commonwealth Edison Company's Nuclear Fuels Services (NFS) review of a Loss of Coolant Accident (LOCA) re-analysis developed by Westinghouse failed to disclose an error in the K(z) figure in Technical Specifications, Figure 3.2-9, in April 1985. The error was discovered by Westinghouse during a review of the Zion 1 Cycle 10 Reload Safety Evaluation. A Technical Specification change to correct the erroneous K(z) figure was submitted to the NRC and adopted on February 26, 1987. As part of the corrective actions for this concern, NFS developed a new procedure for reviewing externally generated analyses, NFS - DPT - 940, "Review of Special External Analyses." The inspector reviewed the procedure and noted that it included the following:

- Provisions for the appropriate, qualified personnel to perform the review
- Verification against regulatory requirements, industry standards, design and safety limits, and Technical Specification
- Proper documentation of the review

This item is closed.

(Closed) Violation (295/85002-01; 304/85002-01): Lack of administrative procedures governing the inservice testing program. On July 5, 1985, the licensee issued administrative procedure ZAP 10-51-1, "Inservice Testing [IST] of Pumps and Valves," which delineates specific responsibilities for implementation of the inservice testing program. This violation is

closed; however, the inspector noted that the ZAP did not include the requirement for verification of valve remote position indications and that provisions for obtaining post-maintenance test data could be improved. The inspector also noted that ZAP 10-51-1 did not reference periodic test PT-13, "ISI [Inservice Inspection] Increased Testing Frequency Program for Pumps and Valves," which defines the licensee's increased frequency testing practices. The licensee stated that a revision of the ZAP was planned following the issuance of the inservice testing program safety evaluation report by NRR in FY 1988. Revision of the ZAP and review by the inspector will be tracked as an open item (295/87036-01; 304/87037-01(DRP)).

(Open) Open Item (295/85002-03; 304/85002-03): Evaluation of valve stroke time increases based on type of valve. The licensee stated that valve stroke times are evaluated as defined in technical staff surveillance (TSS) 15.6.20V-P, "ISI Valve Surveillance - Power Operated Valve Testing." The inspector noted that valve mean stroke times are specified to be used for data analysis. The licensee stated that mean stroke times were only used when analyzing air-operated valve test data and that mean stroke times were not used for the analysis of motor-operated valve test data. The licensee stated that the TSS would be revised to clearly state this practice. This item remains open pending licensee revision of TSS 15.6.20V-P to clarify valve stroke time analysis methods and further review of previous valve test records by the inspector.

(Open) Open Item (295/85002-04; 304/85002-04): Implementation of PT-13 for testing valves with greater frequency, and implementation of "alert" response for valve stroke times. The licensee issued PT-13, "ISI Increased Testing Frequency for Pumps and Valves," on October 10, 1985. PT-13 contains provisions to double the frequency of testing for those pumps and valves which exhibit test data in the alert range for valve stroke time and pump vibration data; however, it is not clear how PT-13 is invoked. Review of several PTs in which valves are stroke timed revealed no requirement to implement PT-13 based on obtained stroke time data. The licensee stated that IST data are evaluated by members of the ISI group and that these personnel are aware of how and when implementation of PT-13 is required. This item remains open pending clarification of when PT-13 is required.

The inspector noted that PT-13 does not require pumps which exhibit differential pressures and flow rates in the alert range to be tested on an increased frequency. Valves which exhibit specified leak rate increases are also not addressed. Revision of PT-13 to address increased frequency testing requirements when any IST data fall in the alert range will be tracked as an open item (295/87036-02; 304/87037-02 (DRP)).

(Closed) Violation (295/85002-07; 304/85002-07): Failure to measure pump suction pressures and bearing temperatures in accordance with the ASME Boiler and Pressure Vessel Code, Section XI. The licensee has revised pertinent surveillance tests to measure and record pump suction pressures

with the pumps running and idle, as required by the ASME Code. With regard to bearing temperatures, the licensee has revised appropriate procedures to require measurement of bearing temperatures, except for the auxiliary feedwater pumps. A relief request concerning measurement of bearing temperatures for the auxiliary feedwater pumps has been submitted to the Commission as provided in 10 CFR 50.55a. This relief request will be reviewed for acceptability by NRR and dispositioned in the associated safety evaluation report which is expected to be issued in FY 1988. This item is closed.

(Closed) Violation (295/85002-09; 304/85002-09): Failure to use controlled, calibrated stopwatches for surveillance testing. Pertinent surveillance procedures specifying use of a timepiece to determine equipment operability have been revised to require documentation of the use of a uniquely identified, accuracy-checked timepiece. This violation is closed.

(Open) Violation (295/87015-01; 304/87018-01): Inadequate corrective actions in response to violation 295/85002-09; 304/85002-09, failure to use controlled, calibrated stopwatches for surveillance testing. The licensee has written procedure IMP-MI-17, "Timepiece Accuracy Check," and installed the equipment necessary to compare the accuracy of station timepieces to a National Bureau of Standards (NBS) traceable standard. Timepiece calibration frequency will be tracked by the instrument department. The inspector noted that current surveillance and associated administrative procedures, notably those associated with the inservice testing program, continue to reference the previous timepiece calibration procedure, which did not use an NBS standard and has been cancelled. This item will remain open pending revision of all pertinent procedures to reflect the use of timepieces calibrated to an NBS standard.

(Open) Violation (304/87016-01): Failure to correctly denote equipment locations on work requests. The licensee's response to this violation stated that those personnel involved with the event were counselled on equipment verification prior to performing work, that ZAP 3-51-1 was revised to emphasize the importance of verification that work is being performed on the correct component, and that ZAP 10-52-6 has been written to establish and implement a station labelling program to provide positive identification of installed equipment. The inspectors have noted a marked improvement in the labelling of various components throughout the plant, as well as an increased effort by plant personnel to verify that they are working on the correct component. The licensee's response stated that guidance for positive equipment identification will be developed by the maintenance department by February 15, 1988. This item remains open pending completion of that task.

(Closed) Open Item (295/87016-01; 304/87016-02): Determination of individuals responsible for verifying equipment location on work requests. ZAP 3-51-1, "Origination and Routing of Work Requests," was revised on November 30, 1987, to specify those individuals (both CECO and contract personnel) who are responsible for verifying that work is

being performed on the correct equipment as identified in the work request. Licensee personnel indicated that the procedure revision would be included in required reading packages for the foremen of all three maintenance shops. Discussions with members of the plant staff revealed that training of contract personnel on positive identification of equipment prior to starting work was completed on January 15, 1988. Members of the licensee's training staff also stated that the ZAP revision would be incorporated into the training lesson plans. This item is closed.

(Closed) Unresolved Item (295/86019-03): Inadvertent isolation of boron injection tank recirculation. This item resulted in the issuance of violation 295/86022-01. This item is closed.

No violations or deviations were identified.

3. Summary of Operations

Both units operated for the entire inspection period at power levels up to 99%. No violations or deviations were identified.

4. Operational Safety Verification and Engineered Safety Features System Walkdown (71707, 71709, 71710, and 71881)

The inspectors observed control room operations, reviewed applicable logs and conducted discussions with control room operators from November 20, 1987 through January 5, 1988. During these discussions and observations, the inspectors ascertained that the operators were generally alert, cognizant of plant conditions, attentive to changes in those conditions, and that they took prompt action when appropriate. The inspectors verified the operability of selected emergency systems, reviewed tagout records and verified the proper return to service of affected components. Tours of the 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 November 20, 1987 to January 14, 1988, the inspectors walked down the accessible portions of the safety injection, residual heat removal, and diesel generator systems, and selected safety-related electrical breakers to verify operability.

These 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.

No violations or deviations were identified.

5. Monthly Surveillance Observation (61726)

The inspector observed Technical Specifications required surveillance testing on the 2A diesel generator, instrument inverter, and nuclear instrumentation systems, and verified whether testing was performed in accordance with adequate procedures, whether limiting conditions for operation were met, whether removal and restoration of the affected components were accomplished, whether test results conformed with Technical Specifications and procedure requirements and 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 reviewed portions of the following completed test activities:

PT-0, Appendix K	Station Battery Daily Record
PT-6	Containment Spray System Tests and Checks
PT-8B	Monthly Operability Test of Service Water Pumps
PT-11	Diesel Generator Loading Test
PT-33	7.5 KVA Instrument Inverter Circulating Current Test
2N-42 E	Power Range Nuclear Instrument Electronics

No violations or deviations were identified.

6. Monthly Maintenance Observation (62703)

Station maintenance activities on the safety-related systems and components listed below were observed or reviewed to ascertain whether they were conducted in accordance with approved procedures, regulatory guides, and industry codes or standards, and in conformance with Technical Specifications.

The following items were considered during this review: the limiting conditions for operation were met while components or systems were removed from service; approvals were obtained prior to initiating the work; activities were accomplished using approved procedures and were inspected as applicable; functional testing and/or calibrations were performed prior to returning components or systems to service; quality control records were maintained; activities were accomplished by qualified personnel; parts and materials used were properly certified; radiological controls were implemented; and fire prevention controls were implemented.

Work requests were reviewed to determine the status of outstanding jobs and to assure that priority is assigned to safety-related equipment maintenance which may affect system performance.

Work was observed and work requests reviewed for the following maintenance activities:

- Repair of 1 MOV SW0009
- Setpoint Change for Diesel Generator Starting Air Compressor Low Pressure Alarm
- Adjustment of Output of 7.5 KVA Instrument Inverter 212 Using Oscilloscope
- Replacement of Torque Bypass Switch on 1 MOV SW-0105

Work request packages were reviewed for the following maintenance activities:

- Repair of Packing Leak of CS-01, Containment Spray Pump Eductor Flow Control Valve
- Adjustment of Torque Switch and Torque Bypass Switch Settings for 1 MOV SW 0105
- Troubleshooting of Nuclear Instrument Power Range Upper and Lower Detector Flux Deviation Alarms

During investigation of the work performed on 1 MOV SW0009, the inspector noted that repairs made to the valve stem were properly discussed with the valve manufacturer to insure their appropriateness. During performance of the work on 1 MOV SW0009, mechanical maintenance personnel were required to remove the valve motor operator and install a block to keep the valve closed; the inspector noted, however, that independent verification by observing normal process instrumentation that the block was properly installed and that the valve was indeed closed was not performed or required by procedure. A review of auxiliary operator rounds revealed that significant pressure and flow were exhibited downstream of the subject valve. The inspector noted that independent process verification that the valve block was holding would have been a work enhancement. Procedure ZAP 3-51-4, "Procedure Governing the Use of Temporary Jumper Cables, the Lifting of Terminated Wires, The Bypassing of Alarms, or the Installation of Mechanical Blocks or Bypasses," does not require verification that a given block, bypass, or lifted lead is installed properly and performing its intended function.

The inspectors attended several meetings held by the licensee to plan daily activities. These meetings were led by the Planning Group, which had recently been increased in size in order to facilitate improved planning of daily activities. The inspectors observed that good cooperation and communication among the station work groups were evident.

No violations or deviations were identified.

7. Licensee Event Report (LER) 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, that immediate corrective action was accomplished, and that corrective action to prevent recurrence had been accomplished in accordance with Technical Specifications. The LERs listed below are considered closed:

UNIT 1

<u>LER NO.</u>	<u>DESCRIPTION</u>
86029	Excessive Power-operated Relief Valve (PORV) Stroke Times

UNIT 2

<u>LER NO.</u>	<u>DESCRIPTION</u>
86005-01	Diesel Generator Auto Start Following Loss of Power to 4KV Engineered Safeguards Features Bus
87009	Missed Technical Specification Surveillance Caused by a Failure to Promptly Notify Control Room Operators of a Procedure Change

Regarding LER 295/86029, this event is tracked by unresolved item 295/86019-02; 304/86018-02.

Regarding LER 304/86005-01, the LER was revised to include additional corrective actions taken by the licensee.

LER 304/87009 discusses the failure of the licensee to perform quadrant power tilt ratio (QPTR) calculations every two hours from November 18, 1987 through November 20, 1987, when both upper and lower flux deviation annunciators were inoperable as required by Technical Specification 4.2.2.B.1.b. On October 2, 1987, the licensee issued a revision to the annunciator response manual (ARM) which stated that an annunciator is considered inoperable when the toggle switch for the audio alarm is defeated. On November 18, 1987, the audio alarms for both the upper and lower high flux deviation alarms were defeated per approved station procedures; however, the required QPTR calculations were not performed until after discovery on November 20, 1987. A review of routine QPTRs calculated every shift and of QPTRs calculated using computer data obtained during the period of interest did not reveal any abnormal trends.

One of the root causes for LER 304/87009 appears to be lack of training regarding the change to the ARM made in early October 1987. The ARM includes causes for the alarms, alarm setpoints, immediate actions, and

actions to be taken in the event that alarms are defeated audibly or otherwise become inoperable. The last item, actions to be taken when defeated or inoperable, was a new part of the procedure. This change was not made known to operators; consequently, they failed to take the proper actions after defeating the power range nuclear instrumentation upper and lower flux deviation alarms. These alarms were defeated because one power range channel was beginning to drift high, causing these alarms to intermittently alarm. The operators defeated the alarms after initiation of a work request, but failed to increase the frequency of reactor QPTRs as required by Technical Specifications.

Until this event, there was no formal means to provide immediate notification to operators in the event of a procedure change (the changes are noted in the required reading program, but the required reading program may lag several weeks behind the procedure change).

The licensee's corrective actions included: issuance of a memo to all licensed personnel explaining the changes to the ARM and clearer identification of Technical Specification related annunciators. The licensee also stated that in the future, the shift night orders will alert operators to procedure changes deemed to be of immediate concern to operators.

Failure of the licensee to perform quadrant power tilt ratio calculations every two hours with both the upper and lower nuclear instrumentation system detector high flux deviation alarms inoperable is a violation of technical specification 4.2.2.B.1.b (295/87036-03; 304/87037-03(DRP)). This violation meets the test of 10 CFR 2, Appendix C, Section V.A; consequently, no Notice of Violation will be issued, and this matter is considered closed.

One violation and no deviations were identified.

8. 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. One event reviewed this period was found to have significant training deficiencies as a contributor and is discussed in Paragraph 7 of this report.

The resident inspectors gave several briefing sessions to shift personnel regarding topics of interest to licensed operators during the period

December 4, 1987 through January 5, 1988. The resident also briefed members of the licensed operator training staff on recent inspection findings regarding the testing of pressure isolation valves.

No violations or deviations were identified.

9. Resident Inspector Followup on NRC Bulletin 87-02, "Fastener Testing to Determine Conformance with Applicable Material Specification (25026)"

Bulletin 87-02 required licensees to select and test safety-related and non-safety-related fasteners for appropriate chemical and physical properties. The bulletin was issued following the testing of samples by the NRC during procurement inspections at the San Onofre, Palo Verde, and Rancho Seco plants. These NRC tests revealed that 11 of 32 fasteners did not meet specification requirements for mechanical or chemical properties, or both.

By memorandum dated November 25, 1987, resident inspectors were directed to witness the licensee's sample selection to ensure that the fasteners selected were representative of installed fasteners, and that suspect fasteners were selected for testing.

The inspector verified that the licensee's sample was chosen according to usage patterns over the past year, and that the materials listed in the bulletin constituted the range of the sample. Several materials listed in the bulletin were not in use at Zion station. The inspector also recorded any manufacturer's markings that were on the fasteners. The inspector noted that some fasteners had no manufacturer's markings. The inspectors verified that the selected fasteners were properly tagged by the licensee.

No violations or deviations were identified.

10. Followup of Region III Requests (92701)

The resident inspectors, at the request of Region III management, queried members of the licensee's staff on the subject of NRC Information Notice (IEN) 87-44, "Thimble Tube Thinning in Westinghouse Reactors." The IEN identifies potential problems resulting from thimble tube thinning in the area between the lower core plate and the fuel assembly guide tubes, where the thimble tubes are unsupported and subjected to turbulent flow conditions. The IEN noted that retraction of the thimble tubes would move any thinned areas out of the region of high turbulence and that periodic eddy current testing of the thimble tubes would identify those tubes which had experienced wall thinning.

The licensee stated that a modification performed in 1986 on the seal table had resulted in retracting the thimble tubes approximately 1.5 inches. The licensee also stated that approximately 1.983 inches of the thimble tubes are subjected to turbulent flow conditions. The licensee stated that eddy current testing of thimble tubes is tentatively planned for the 1989 refueling outage and 1990 refueling outage for Units 1 and 2, respectively.

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. Two Open Items disclosed during this inspection are discussed in Paragraph 2.

12. Violations For Which a "Notice of Violation" Will Not Be Issued

The NRC uses the Notice of Violation as a standard method for formalizing the existence of a violation of a legally binding requirement. However, because the NRC wants to encourage and support licensees' initiatives for self-identification and correction of problems, the NRC will not generally issue a Notice of Violation for a violation that meets the tests of 10 CFR 2, Appendix C, Section V.A. These tests are: (1) the violation was identified by the licensee; (2) the violation would be categorized as Severity Level IV or V; (3) the violation was reported to the NRC, if required; (4) the violation was or will be corrected, including measures to prevent recurrence, within a reasonable time; and (5) it was not a violation that could reasonably be expected to have been prevented by the licensee's corrective action for a previous violation. A violation of regulatory requirements identified during the inspection for which a Notice of Violation will not be issued is discussed in Paragraph 7.

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 January 14, 1988, 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.