

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

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Report No: 50-295/97016; 50-304/97016

Licenses: Commonwealth Edison Company

Facility: Zion Nuclear Plant, Units 1 and 2

Location: 101 Shiloh Boulevard
Zion, IL 60099

Dates: May 30 through July 18, 1997

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Nuclear Safety Inspector

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EXECUTIVE SUMMARY
Zion Nuclear Plant, Units 1 and 2
NRC Inspection Reports 50-295/97016; 50-304/97016

This inspection included aspects of licensee operations, maintenance, and engineering. The report covers a seven-week period of inspection activities by the resident staff.

Licensee performance during this inspection period was characterized by numerous deficiencies in the control of the configuration of plant systems and equipment. However, neither operations department personnel nor your staff's use of the corrective action process identified that an adverse trend had developed. Inspector identification of the numerous material condition deficiencies in the control room called into question the effectiveness of the previous system walkdowns conducted to assess the material readiness of Unit 2 for restart.

Operations

- The inspectors concluded that the licensee's implementation of the Operational Readiness Demonstration Program was adversely impacted by inadequate planning and inconsistent implementation of the Zion Operations Department Standards. (Section O1.1)
- The inspectors identified an adverse trend in the licensee's control of the configuration of plant systems and equipment. (Section O1.2)
- A violation was identified involving the failure to follow an operating special procedure for the 2A emergency diesel generator (EDG). (Section O1.2)

Maintenance

- A violation was identified for the failure to provide appropriate guidance for setting the droop potentiometer prior to loading the 0 EDG. (Section M3.1)
- The inspectors identified a violation pertaining to the failure of a quality control inspection to verify conformance with work instructions for the 0 EDG governor modification. (Section M7.1)

Engineering

- The inspectors concluded that the pre-evolution briefing for an isolation valve seal water system test was effective at identifying and resolving potential problems. (Section E2.1)
- The inspectors identified numerous material condition deficiencies in the control room. Of particular concern was the failure of the licensee to identify these problems during recent system affirmations on the control room ventilation system. (Section E2.2)

Report Details

Summary of Plant Status

During this inspection period, the licensee maintained Unit 1 in a defueled status, and Unit 2 in a cold shutdown, depressurized condition pending completion of restart actions delineated in the Zion Recovery Plan.

I. Operations

O1 Conduct of Operations

O1.1 Operational Readiness Demonstration Program Implementation

a. Inspection Scope (71707)

The inspectors observed licensee implementation of the Operational Readiness Demonstration Program (ORDP). The inspectors observed control room activities, attended ORDP daily debriefs, interviewed operators, and reviewed applicable documentation.

b. Observations and Findings

On July 7, 1997, the licensee initiated the ORDP to assure the effectiveness of the corrective actions taken to resolve the fundamental operator performance issues resulting from the February 21, 1997, reactivity management event. The purpose of the ORDP was to verify that the operators and shift crews could implement management's expectations for plant operations and verify management support of operations through day-to-day plant activities. The ORDP consisted of a series of operating tasks that were selected to validate plant and operator readiness prior to returning the plant to power operations. The operating tasks selected for observation included routine and infrequent surveillance activities and off-normal evolutions. The observations of the ORDP activities were conducted by operations line and shift management, industry peers, and site and corporate independent oversight groups. The expected time period to complete the ORDP was approximately four weeks, with changes being anticipated as a result of management's assessment of performance.

During the first week of the ORDP implementation, the licensee focused its efforts on developing and refining the processes supporting the ORDP. For example, the ORDP guidance document which included expectations, performance measures, and observation guidelines was not issued by the licensee until July 9, two days after the ORDP commenced. During the second week of the ORDP implementation, the number and quality of observations conducted significantly increased. However, only one of four special activities planned for the ORDP was actually conducted due to work planning and scheduling problems.

The inspectors attended several ORDP daily meetings and observed that numerous observations (approximately 20-30 per day) of control room and in-plant activities were being conducted. The inspectors noted that the majority of the documented licensee observations provided meaningful insights on various aspects of operator performance including log keeping, control room decorum, communications, effectiveness of turnovers, and effectiveness of non-licensed operator rounds. However, the inspectors observed that the standards applied during the observations were not always consistent with the Zion Operations Department Standards. For example, confusion existed between a management observer and an operator regarding expectations on the technique to identify a component before operating it.

c. Conclusion

The inspectors concluded that the effectiveness of the first two weeks of the ORDP was mixed. Positive attributes of the ORDP included the numerous observations performed, which resulted in good insights on operator performance. However, the implementation of the program was marred by inadequate planning and inconsistent application of the Zion Operations Department Standards.

O1.2 Adverse Trend in Configuration Control of Plant Systems and Equipment

a. Inspection Scope (71707)

The inspectors identified an adverse trend in the control of the configuration of plant systems and equipment. The inspectors interviewed operations, maintenance, and radiation protection personnel, and reviewed applicable procedures and documentation including the completed apparent cause evaluations.

b. Observations and Findings

During this inspection period, the inspectors noted six examples of inadequate configuration control. During follow-up inspection activities, the inspectors identified that the licensee was slow to investigate the circumstances surrounding these occurrences; and, the licensee failed to recognize that an adverse trend had developed. Specifically:

2A Emergency Diesel Generator (EDG) 3L Kiene Valve Out-of-Position Open

On June 8, 1997, during performance of periodic test (PT) 11-DG2A, "2A Diesel Generator Loading Test," a non-licensed operator heard an abnormal noise and determined that the 3L Kiene valve (cylinder test valve) was open. The operator subsequently tripped the 2A EDG and initiated Problem Identification Form (PIF) Z1997-00107. The operating shift's immediate corrective actions included repositioning the 3L Kiene valve closed and verifying that all of the remaining Kiene valves on each EDG were closed.

The licensee assigned the PIF to the mechanical maintenance department for investigation. The department personnel completed the cause evaluation on June 18, 1997, and concluded that during the last performance of Operating Special Procedure (OSP) 97-012, "2A Diesel Generator Liner Test," Revision 1, on May 10, the valve was not closed as required in Section 5.58.

The inspectors' review of this occurrence identified several contributors that were not discussed in the apparent cause evaluation including: the peer evaluation for this step was not completed by an individual with equivalent qualification; the peer evaluator observed the mechanic's actions and did not verify that the valve was actually closed; and all 16 actions in the step were completed before any sign-offs were made for the individual actions. As a result, maintenance management promulgated to the maintenance department the expectations for performing peer evaluations and for documenting multiple tasks within a single step.

As previously documented in NRC Inspection Reports 50-295/96014; 50-304/96014, 50-295/96017; 50-304/96017, and 50-295/97013; 50-304/97013, the failure of maintenance personnel to follow procedures continues to be an area of concern. The failure to close the 3L Kiene valve on the 2A EDG as required by OSP 97-012, Section 5.58, is considered a violation of 10 CFR Part 50, Appendix B, Criterion V, (50-304/97016-01), as described in the attached Notice of Violation.

011 125 Volt-D C. Battery Ventilation Found Secured

On June 11, 1997, a non-licensed operator identified that the 011 battery room ventilation system was secured when the system should have been in operation. The operating shift subsequently reenergized the system and initiated PIF Z1997-00165.

The licensee assigned the PIF to the electrical maintenance department for investigation. Based on the results of this evaluation, the licensee concluded that the cause of the occurrence was unknown since electrical maintenance had no reason to secure the system, and there was no way of knowing why or when the ventilation was secured. The inspectors were concerned that the evaluation was completed and approved, and the respective Nuclear Tracking System item was closed without any involvement by the operations department. The inspectors' concern was based on the fact that the operations department had operational authority for all plant systems and equipment, but in this case was not involved in determining why a safety-related battery ventilation system was not in its expected configuration.

Auxiliary Feedwater (AFW) Low Suction Pressure Transmitter Found Isolated

On June 16, 1997, a Unit 2 Nuclear Station Operator noted that the Auxiliary Feedwater Pump Suction Pressure Low annunciator had not cleared as expected following the final clearance of an AFW out-of service (OOS) instruction. Investigation by a non-licensed operator identified that the root valve for the

pressure transmitter was closed. The operating shift repositioned the valve open and initiated PIF Z1997-00256. On July 25, in response to the inspectors' questions and requests for information, the licensee determined that the PIF had never been screened by the event screening committee and that no further investigation had been initiated.

1B EDG Switches Found Out-of-Position During an OOS Independent Verification

On July 16, 1997, during the performance of independent verification for the 1B EDG OOS 970007285, a non-licensed operator identified that two control switches were out of position. Both of the control switches for the 1B EDG train B starting air compressor and the 1B EDG 1BW diesel oil transfer pump were in the "auto" instead of "off" position. The operator repositioned the control switches, and the licensee completed a subsequent independent verification. In response to this occurrence, the Unit Supervisor initiated PIF Z1997-00720. At the end of the inspection period, the licensee's investigation was in progress.

Containment Radiation Monitor Deenergized Without Authorization Resulting in a Containment Ventilation Isolation Signal

On July 14, 1997, Unit 2 received an unexpected containment ventilation isolation actuation signal as a result of a radiation protection technician (RPT) performing troubleshooting activities on the containment air sampling monitor, 2RIA-PR40. The RPT was investigating a problem with the monitor involving the failure of two channels to reset from the maintenance mode. The RPT informed Unit 2 control room operators of this condition and that an action request would be generated to correct the problem. The RPT subsequently notified the Unit 1 control room operators of his intent to deenergize the monitor for troubleshooting; however, the Unit 1 operators failed to inform the Unit 2 operators. When the monitor was subsequently deenergized, an unexpected Unit 2 containment isolation actuation signal for the closure of the containment ventilation valves resulted. Since the containment ventilation valves were already closed, no actual valve movement occurred.

The inspectors were concerned that this event occurred as the result of poor communications and a lack of command and control of plant activities by control room operators. Specifically, the Unit 1 operators failed to inform the Unit 2 operators that a Unit 2 component was going to be deenergized, and the control room staff failed to evaluate the expected plant response prior to the radiation monitor being deenergized. The less-than-adequate operator performance combined with an RPT performing troubleshooting without a clear understanding of the implications, was considered to be another example of inadequate configuration control. Additional inspector review of this event was documented in NRC Inspection Report No. 50-295/97020; 50-304/97020.

Fire Protection Valve Found Out-of-Position Closed

On July 17, 1997, during the performance of System Operating Instruction 65, Appendix A, Part II, "Fire Protection System Essential Valve Line-Up," operations department personnel found the Unit 0 fire protection area 0-AF alarm valve OFP0494 alarm inlet isolation valve, OFP0760, out-of-position closed. The licensee subsequently repositioned the valve open and initiated PIF Z1997-00736.

During a subsequent walkdown of the equipment, the Fire Marshall determined that the flow switch for the fire protection header, which this valve isolated, was not electrically connected. Consequently, the Fire Marshall concluded that the valve being out of position did not affect system operation. However, the inspectors identified that the fire protection system drawing, M-43, indicated that the flow switch was in-service. The licensee's development of corrective action was in progress at the close of the inspection period.

c. Conclusions

The inspectors concluded that even though the operations department had operational authority over all plant systems and components, operations department personnel were only involved in investigating the circumstances surrounding the 1B EDG OCS error. Furthermore, neither operations department personnel or staff use of the corrective action process identified that an adverse trend was developing with the control of the configuration of plant systems and equipment.

In response to the inspectors' identification of the adverse trend in configuration control, the licensee initiated PIF Z1997-00893 and a formal root cause investigation. This issue is considered an Unresolved Item (50-295/97016-02; 50-304/97016-02) pending NRC review of the licensee's root cause investigation for configuration control deficiencies including: (1) the secured 011 battery ventilation, (2) the isolated AFW low suction pressure transmitter, (3) the out-of-position 1B EDG switches, and (4) the out-of-position fire protection valve OFP0760.

O3 Operations Procedures and Documentation

O3.1 Operator Response to Steam Generator (SG) Tube Rupture

Based on the observations of three operating crews during simulator scenarios, the licensee identified that operator response time to a SG tube rupture event was longer than assumed in the Updated Final Safety Analysis Report (UFSAR). During the performance of several simulator scenarios involving SG tube ruptures, the licensee staff noted that three operating crews required 34, 39, and 41 minutes, respectively, to stop the leak. The UFSAR assumes that operators can isolate and stop the leak from a ruptured SG within 30 minutes of accident initiation.

Specifically, UFSAR Section 15.6.3.1 states:

"Consideration of the indications provided at the control board, together with the magnitude of the break flow, leads to the conclusion that the isolation procedure can be completed within 30 minutes of accident initiation."

In addition, UFSAR Section 15.6.3.4 states that in determining the mass transfer through the broken tube to calculate the estimated dose at the site boundary, the following assumption is made:

"The operator identifies the accident type and terminates break flow to the faulty steam generator within 30 minutes of accident initiation."

Following the identification of this discrepancy with the UFSAR requirements, the licensee initiated PIF Z1997-00565. This issue is considered an Unresolved Item (50-295/97016-03; 50-304/97016-03) pending NRC review of the licensee's actions to resolve the discrepancy between UFSAR assumptions and observed operator response time to a SG tube rupture simulator scenario.

II. Maintenance

M1 Conduct of Maintenance

M1.1 2A Safety Injection (SI) Pump Testing

a. Inspection Scope (61726)

The inspectors reviewed the circumstances related to a failed 2A SI pump surveillance. The inspectors reviewed PT-2A-RT, "Safety Injection Tests During Refueling," PIFs Z1997-00130 and Z1997-00131, and applicable documentation. The inspectors also interviewed operators and the SI system engineer.

b. Observations and Findings

On June 9, 1997, during the licensee's performance of PT-2A-RT, the 2A SI pump failed the surveillance due to the pump head being higher than the set value range. Based on the measured pump discharge pressure, the licensee determined the calculated pump head to be 3,392.2 feet. The pump head set value prescribed by the procedure was 3,249 to 3,381 feet. The licensee initiated PIF Z1997-00131 to document this discrepancy and track corrective actions.

In addition, during this test, the licensee flushed the 2A SI pump recirculation line strainer and found three pieces of debris. As a result, the licensee initiated PIF Z1997-00130 to track the investigation of the foreign material in the SI system. As previously documented in NRC Inspection Report 50-295/95-03; 50-304/95-03,

SI pump recirculation line orifice plugging due to debris has been a long-standing problem. Consequently, the licensee recently installed the strainers in the SI pump recirculation lines to prevent the clogging of the SI orifices. The inspectors were concerned that the cause for the introduction of foreign material into the SI system has not been effectively resolved.

c. Conclusions

This issue is considered an Unresolved Item (50-295/97016-04; 50-304/97016-04) pending NRC review of the licensee's evaluation of the 2A SI pump head being above the set value range and the debris found during the flush of the 2A SI pump recirculation line strainer.

M3 Maintenance Procedures and Documentation

M3.1 Inadequate Procedural Guidance Resulted in Improper Setting of the 0 EDG Governor

a. Inspection Scope (62707 and 37551)

During post-maintenance testing, the 0 EDG began self-loading following closure of the output breaker. At a load of approximately 1.5 MW and increasing, the Nuclear Station Operator (NSO) manually opened the output breaker, which prevented potential overload of the EDG. The inspectors observed selected portions of the maintenance, interviewed engineering and maintenance department personnel, and reviewed applicable maintenance and testing procedures.

b. Observations and Findings

On June 26, 1997, during the performance of Technical Staff Surveillance Procedure (TSSP) 008-97, "Diesel Generator 0 Governor Test Fast and Slow Starting Modes Construction Test," Section 31, "Paralleling the Diesel Generator with the Grid (Remote, Fast Start, Droop Mode, Generator Loading)," the 0 EDG began self-loading after the operator closed the output breaker. The NSO manually opened the output breaker when load was approximately 1.5 MW and increasing. The licensee shut down the 0 EDG and developed a troubleshooting plan. While completing the troubleshooting plan, the licensee identified that the electronic governor droop potentiometer, which serves to regulate diesel loading when paralleling to the grid, was set at zero. This setting caused the governor to act as if it was in the isochronous mode, i.e., maintaining a set frequency. As a result, without operator action, the EDG could have been overloaded when paralleled to the grid in the isochronous mode.

The licensee determined that the Instrument Maintenance Procedure OS-DG86, "0 DG [Diesel Generator] Engine RPM [Revolutions per Minute] Governor Control," which satisfied prerequisite B.1.1 of TSSP-008-97, set the droop potentiometer at zero in step 5.15.1. The engineers who wrote the test assumed that the droop potentiometer was set at mid-scale in conflict with the prerequisite Step B.1.1.

Also, several places in TSSP-008-97, the statement, "At the direction of the Test Engineer, PERFORM ADJUSTMENTS as necessary to optimize OSC-DG86 [governor]," existed. However, there was no specific guidance in the test procedure to set the droop potentiometer at mid-scale.

c. Conclusions

The inspectors concluded that due to a lack of guidance in TSSP-008-97 for setting the droop potentiometer, the electronic governor was set incorrectly. As a result, the EDG could have been overloaded when paralleled to the grid in the isochronous mode. As previously documented in NRC Inspection Reports 50-295/96014; 50-304/96014 and 50-295/96017; 50-304/96017, the failure to provide appropriate procedures for maintenance activities continues to be an area of concern. The failure of TSSP-008-97 to provide appropriate guidance for setting the droop potentiometer prior to loading the 0 EDG is considered an example of a violation of 10 CFR Part 50, Appendix B, Criterion V (50-295/97016-05; 50-304/97016-05), as described in the attached Notice of Violation.

M7 Quality Assurance in Maintenance Activities

M7.1 Inadequate Quality Control (QC) Inspection During 0 EDG Governor Modification Installation

a. Inspection Scope (62707 and 37551)

During post-maintenance testing, the 0 EDG tripped due to the failure of both #1 and #2 magnetic pickup units (MPUs). The inspectors observed selected portions of the maintenance; interviewed engineering, construction, and QC personnel; and reviewed the applicable maintenance and QC instructions.

b. Observations and Findings

On June 25, 1997, during the performance of Technical Staff Surveillance Procedure (TSSP) 008-97, "Diesel Generator 0 Governor Test Fast and Slow Starting Modes Construction Test," Section 26, "Diesel Generator Start with Electronic Governor OSC-DG86 (Local, Fast Start, Droop Control, No Loading)," the 0 EDG tripped immediately on starting. The initial indication of the cause of the trip was the failure of both the #1 and #2 MPUs. During troubleshooting, the licensee identified that a loose strand of wire was discovered in the amphenol connector at the governor actuator. The strand caused a ground which degraded the MPU signals and resulted in the trip signal being generated. The licensee subsequently repaired the connection, and initiated PIF Z1997-00455.

The licensee installed this connector in accordance with the work instructions provided in Work Package No. 950069039-01, "0 D/G [Diesel Generator] Governor Outage - Electrical," Step 38, which references several documents including Document #101, "Soldering Procedure for Electrical Components," and Document #50, "Instrument/Control Cable Termination Checklist." However,

during the installation, the electrician apparently did not notice that a strand of the conductor was loose and not properly soldered.

The inspectors identified that this connection had received a QC inspection which was not adequate to identify the loose conductor strand. The inspectors also identified several contributors including: Document #50, "Instrument/Control Cable Termination Checklist," the checklist utilized for the QC inspection, did not provide guidance on the verification of solder connections; and Document #101, "Soldering Procedure for Electrical Components," Section 4.0, which contained specific guidance for the QC inspection of solder connections, was not referenced.

c. Conclusions

The inspectors concluded that the QC inspection of the amphenol connector at the governor actuator was not adequate to identify the loose conductor strand, which subsequently resulted in the protective trip of the 0 EDG during post-maintenance testing.

The failure of the QC inspection to verify conformance with the documented instructions for installing the amphenol connector is considered a violation of 10 CFR Part 50, Appendix B, Criterion X (50-295/97016-06; 50-304/97016-06), as described in the attached Notice of Violation.

M8 Miscellaneous Maintenance Issues

- M8.1 (Closed) IFI 50-295/304-95003-05: Foreign material in the 1B SI pump recirculation line orifice. This issue is closed to Unresolved Item 50-295/97016-04; 50-304/97016-04 (see Section M1.1).

III. Engineering

E2 Engineering Support of Facilities and Equipment

E2.1 Isolation Valve Seal Water Testing

a. Inspection Scope (61726 and 37551)

The inspectors evaluated the licensee's conduct of the isolation valve seal water (IVSW) system testing. The inspectors observed the testing, reviewed test procedure TSSP 15.6.88, "Isolation Valve Seal Water System Operability Test," Revision 18, and interviewed operators and the system engineer.

b. Observations and Findings

On June 20, 1997, the licensee commenced IVSW testing in accordance with TSSP 15.6.88. Prior to the conduct of the evolution, operators walked

down the procedure, and the system engineer led a pre-test briefing. The briefing was attended by licensed and non-licensed operators involved in the test, including operations shift supervision. The briefing included a detailed discussion of the purpose of the test, test precautions and limitations, and a review of the test procedure. The inspectors observed that operators actively participated in the briefing which resulted in test performance enhancements. For example, the operators identified that the radwaste operator needed to be contacted prior to test performance to ensure that sufficient tank capacity was available to receive the water that was to be drained during the test. The system engineer evaluated the operator's concerns and implemented procedure changes as necessary prior to the test performance.

Once the concerns raised during the pre-evolution briefing were resolved, the licensee commenced performance of the test. Shortly after the test was started, the licensee stopped the test because it found a valve, which was assumed to be open as an initial condition for TSSP 15.6.88, closed. Specifically, the licensee found the "Tank Emergency Service Water Isolation, Upstream of Regulator," 2IW0174, closed. The licensee stopped the test and initiated a procedure revision, and subsequently completed two-thirds of the test satisfactorily. The licensee then put the test on hold pending completion of reactor coolant pump (RCP) testing.

Following the completion of RCP testing, the licensee recommenced preparations to complete TSSP 15.6.88. On June 25, during the pre-test walkdown, the system engineer identified that a temporary pressure gauge, which was installed to support TSSP 15.6.88, was over-ranged. The licensee determined that the test gauge (0-100 lb) was damaged during RCP testing when it was exposed to approximately 350 lbs. of reactor coolant system pressure. The licensee replaced the test gauge, and completed the test. However, the licensee also found the second temporary pressure gauge over-ranged. The licensee initiated PIF Z1997-00609 to document over-ranging of the test gauges. At the end of this inspection period, the licensee's investigation was in progress.

c. Conclusions

The inspectors concluded that the IVSW system testing pre-brief conducted on June 20, was effective. Contributing significantly to the effectiveness of the briefing was the open dialogue between operators and engineering personnel which resulted in the identification and resolution of potential problems. However, the inspectors were concerned with the adequacy of the pre-evolution walkdown and the licensee's control of system configuration, as reflected in valve 2IW-0174 being found out of its expected TSSP 15.6.88 position. In addition, the over-ranging of the test gauge twice provided further indication that there were potential deficiencies in the licensee's control of plant configuration during testing.

This issue is considered an Unresolved Item (50-304/97016-07) pending NRC review of the licensee's investigation of IVSW testing deficiencies including: (1) the cause and corrective actions associated with valve 2IW-0174 being out of the expected position specified by TSSP 15.6.88, including adequacy of pre-evolution

walkdowns, and (2) the cause and corrective actions for the over-ranging of the temporary pressure gauges.

E2.2 Degraded Material Condition of the Control Room

a. Inspection Scope (71707 and 37551)

The inspectors identified numerous material condition deficiencies in the control room while inspecting the accessible portions of the control room overhead and areas that were made accessible due to the installation of scaffolding. The inspectors discussed the deficiencies with engineering and maintenance personnel, reviewed the licensee's corrective actions, and reviewed applicable documentation.

b. Observations and Findings

On June 13, 1997, during an inspection of the control room overhead while accompanied by licensee engineering personnel, the inspectors identified numerous material condition deficiencies including:

- a significant amount of miscellaneous debris located throughout the control room overhead
- several missing cable tray covers
- numerous improperly secured wireway covers
- cables improperly placed in trays
- numerous missing covers on conduit junction boxes
- missing covers for openings in the top of the control panels
- several dead weight supports disconnected
- three exhaust ventilation ducts missing or improperly connected

In response to the walkdown conducted by the inspectors, the licensee performed further walkdowns to determine the scope of the problems and identified similar additional examples. Consequently, the licensee initiated four action requests (each with multiple tasks), three engineering requests, and seven PIFs to resolve the identified deficiencies. On July 17, following completion of the maintenance activities to correct the above deficiencies, the inspectors performed a follow-up inspection of the Unit 2 control room overhead and identified similar additional deficiencies. As a result, the licensee initiated another action request to correct these problems.

In response to the inspectors' concerns, the ventilation system engineer identified an additional 11 exhaust ventilation ducts that had never been installed as specified in the drawing (M-315, "Control Room HVAC [Heating, Ventilation, and Air Conditioning] System El. 642'-0") and 3 ducts that were not described in the drawing. As a result, the licensee initiated an engineering request, ER9703730, to determine whether the as-built configuration of the control room ventilation system met the design requirements. The licensee subsequently determined that this issue needed to be resolved prior to restart of Unit 2. This issue is considered an Unresolved Item (50-295/97016-08; 50-304/97016-08) pending NRC review of the

licensee's evaluation of the as-built configuration of the control room ventilation system and its ability to fulfill the required safety functions.

The control room ventilation system was one of twelve systems that the licensee reviewed as part of the system readiness assessments and affirmations conducted in January 1997 to support the Unit 2 restart. This system was also one of the 16 systems reviewed as part of the Zion Recovery Program System Readiness Review conducted in April 1997. The objective of these reviews was to assure that all system deficiencies were identified, documented, and evaluated for their effect on operability. The inspectors were concerned with the effectiveness of these system readiness reviews given the type and number of deficiencies identified by the NRC following the licensee's completion of these reviews. At the end of the inspection period, the licensee was in the process of evaluating the effectiveness of the system affirmations.

c. Conclusions

The inspectors concluded that a lack of a questioning attitude and low standards by licensee personnel contributed to the failure of the licensee to identify the degraded material condition of the equipment in the control room. In addition, the system walkdowns to support the control room ventilation system affirmations conducted to support Unit 2 restart did not include all accessible portions of the system and did not include verification that the system was installed as designed.

E8 Miscellaneous Engineering Issues

E8.1 Non-Conservative Power Range Rate Trip Setpoint Tolerances

On July 15, 1997, the licensee identified that the current instrument maintenance (IM) procedure acceptance criteria for the nuclear instrumentation power range rate trip setpoint was not conservative. Specifically, IM procedures N-41 through N-44, "Power Range Nuclear Instrumentation," required that the power range rate trip be calibrated to trip at 5 percent of rated neutron flux in 2 seconds with an allowable tolerance of +1 percent. Technical Specifications Section 2.1.1.C and Table 3.1-1, required that the trip be set at less than or equal to 5 percent of rated neutron flux in 2 seconds. Upon identification of this non-conservative calibration of multiple channels of safety system instrumentation, the licensee initiated PIF Z1997-00683 and reported the condition to the NRC in accordance with 10 CFR Part 50.72.

At the end of this inspection period, the licensee's investigation of this problem was in progress. This issue is considered an Unresolved Item (50-295/97016-09; 50-304/97016-09) pending the licensee's completion of its investigation of the power range rate trip tolerance discrepancy including (1) the cause of the discrepancy, (2) its safety significance, and (3) the appropriate corrective actions.

E8.2 Teflon used in Containment Hatch Seals

On July 17, 1997, the licensee identified that the seals utilized on containment escape hatch shafts may potentially not be qualified for the postulated maximum post-accident radiation fields. The teflon seals were identified as being susceptible to break down when exposed to a high radiation field which could have resulted in a direct leak path from the containment atmosphere to the environment. The licensee initiated PIF Z1997-00696 to document the potential problem and track corrective actions. The licensee notified the NRC of the problem in accordance with 10 CFR Part 50.72. This issue is considered an Unresolved Item (50-295/97016-10; 50-304/97016-10) pending NRC review of licensee actions to resolve the containment escape hatch shaft seal qualification concern.

V. Management Meetings

X1 **Exit Meeting Summary**

The inspectors presented the inspection results to members of licensee management at the conclusion of the inspection on July 30, 1997. The licensee acknowledged the findings presented.

The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

Partial List of Persons Contacted

Licensee

R. Starkey, Plant General Manager
T. O'Connor, Restart Manager
R. Godley, Regulatory Assurance Manager
E. Katzman, Radiation Protection Manager
T. Kerwin, Work Control/Outage Manager
T. Luke, Engineering Manager
M. Schimmel, Unit 2 Maintenance Manager
M. Weis, Business Manager
C. Winters, Shift Operating Supervisor
J. Brandes, Assistant Shift Operating Supervisor
K. Dickerson, Executive Assistant to Site V.P.
M. Weis, Business Manager
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NRC

G. Grant, Director, Division of Reactor Projects
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List of Inspection Procedures Used

IP 37551 Engineering
IP 61726 Surveillance Observations
IP 62707 Maintenance Observations
IP 71707 Plant Operations

List of Items Opened, Closed, and Discussed

Opened

50-304/97016-01	VIO	Failure to close the 3L Kiene valve on the 2A EDG as required by OSP 97-012
50-295/304-97016-02	URI	Review of the root cause investigation for configuration control deficiencies including: (1) the O11 battery ventilation being secured; (2) the isolation of the AFW low suction pressure transmitter; (3) the 1B EDG switches being found out-of-position during an OOS independent verification; and (4) the fire protection valve OFP0760 being out-of-position closed.
50-295/304-97016-03	URI	Review of the licensee's actions to resolve the discrepancy between UFSAR assumptions and observed operator response time to a SG tube rupture simulator scenario
50-295/304-97016-04	URI	Review of the licensee's evaluation of the 2A SI pump head being above the set value range and the debris found during the flush of the 2A SI pump recirculation line strainer
50-295/304-97016-05	VIO	Failure to provide appropriate guidance for setting the droop potentiometer prior to loading the 0 emergency diesel generator
50-295/304-97016-06	VIO	Failure of a quality control inspection to verify conformance with work instructions for the 0 emergency diesel generator governor modification
50-304/97016-07	URI	Review of the licensee's investigation of the IVSW testing deficiencies
50-295/304-97016-08	URI	Review of the licensee's evaluation of the as-built configuration of the control room ventilation system and its ability to fulfill the required safety functions
50-295/304-97016-09	URI	Review of licensee actions to resolve the power range rate trip tolerance discrepancy
50-295/304-97016-10	URI	Review of licensee actions to resolve the containment escape hatch shaft seal qualification concern

Closed

50-295/304-95003-05	IFI	Review the foreign material in the 1B SI pump recirculation line orifice
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List of Acronyms

AFW	Auxiliary Feedwater
EDG	Emergency Diesel Generator
IFI	Inspector Follow-up Item
IM	Instrument Maintenance
IP	Inspection Procedure
IVSW	Isolation Valve Seal Water
MPU	Magnetic Pickup Unit
NRC	Nuclear Regulatory Commission
NSO	Nuclear Station Operator
OOS	Out-of-Service
ORDP	Operational Readiness Demonstration Program
OSP	Operations Special Procedure
PDR	Public Document Room
PIF	Problem Identification Form
PT	Periodic Test
QC	Quality Control
RCP	Reactor Coolant Pump
RPT	Radiation Protection Technician
SG	Steam Generator
SI	Safety Injection
TSSP	Technical Staff Surveillance Procedure
UFSAR	Updated Final Safety Analysis Report
URI	Unresolved Item
VIO	Violation