ENCLOSURE 2

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

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Report No.:	50-361/96-09 50-362/96-09
Licensee:	Southern California Edison Co.
Facility:	San Onofre Nuclear Generating Station, Units 2 and 3
Location:	5000 S. Pacific Coast Hwy. San Clemente, California
Dates:	July 28 through September 7, 1996
Inspectors:	J. A. Sloan, Senior Resident Inspector J. J. Russell, Resident Inspector D. L. Solorio, Resident Inspector D. G. Acker, Senior Project Inspector, WCFO
Approved By:	D. F. Kirsch, Chief, Branch F Division of Reactor Projects

ATTACHMENTS:

Attachment 1: Partial List of Persons Contacted
List of Inspection Procedures Used
List of Items Opened, Closed, and Discussed
List of Acronyms

EXECUTIVE SUMMARY

San Onofre Nuclear Generating Station, Units 2 and 3
NRC Inspection Report 50-361/96-09; 50-362/96-09

Operations

- Command and control of a Unit 3 downpower evolution, with the exception of one dilution, were generally consistent with documented licensee management expectations and procedures. Command and control of the dilution were adequate. Operator attention to indications was good (Section O1.1).

- Operators responded promptly and effectively to a transient resulting from the stuck feedwater control valve during the Unit 3 downpower (Section O1.1).

- The licensee failed to declare Inverter 2Y003 inoperable and to take the actions specified by Technical Specification (TS) Limiting Condition for Operation (LCO) 3.8.7, as required by TS Surveillance Requirement (SR) 3.0.1, after the output voltage was identified as being outside the acceptance criteria for TS SR 3.8.7.1 (documented in the Operator Rounds System). This is a violation of TS SR 3.0.1 (Section O1.2).

- Operations management focused on nuclear safety in not wanting to transfer the inverter loads to the alternate source, which was less reliable, as long as the inverter was operable. Management considered the inverter operable based on the judgment of the shift technical advisor (STA) and cognizant engineer (Section O1.2).

- A weakness in the performance of operator rounds was identified as the result of operators not identifying a 4-month old boric acid buildup in an easily accessible, well lighted area. The inspector identified this condition, which was the result of a crack in the letdown system piping (Section O2.1).

- An evaluated simulator scenario, conducted by the training staff, sufficiently exercised operator skills to allow effective evaluation of their performance. Operators performed as expected, with no deficiencies observed by the inspector (Section O5.1).

Maintenance

- The licensee determined that the Operator Rounds System, used to accomplish a weekly surveillance test, was not appropriate for the circumstances, in that the acceptance criteria were not clearly understood as being acceptance criteria, and the instrument used, in conjunction with the acceptance criteria, did not have the required accuracy to confirm that the voltage was within the design range. This

licensee-identified and corrected violation is being treated as a noncited violation (Section O1.2).

- Minor material deficiencies were generally being identified by the licensee, although some were not. The increase in the number of inspector-identified deficiencies indicates a slight negative trend in material condition. However, the overall material condition, with respect to boric acid leaks, was very good and was being well-managed (Section M2.1).

- The inspector identified that one value in a completed surveillance test for nuclear instrument subchannel amplifier gains was not within the acceptance criteria. This observation had no safety consequence since the gain was actually satisfactory and the technician had mistakenly recorded an in-specification parameter as out of specification. The instrumentation and controls (I&C) technicians, in this instance, demonstrated inattention to detail by recording a meter reading erroneously (Section M3.2).

- The licensee identified that a reactor coolant system (RCS) iodine analysis SR had been missed as the result of operators' failure to identify that reactor power had changed more than 15 percent in one hour during a downpower evolution in Unit 3. This licensee-identified and corrected violation is being treated as a noncited violation (Section M8.1).

Engineering

- The operability assessment documented in Action Request (AR) 960801065 provided some assurance that the loads on Inverter 2Y003 could tolerate the observed inverter output voltage. However, it was weak in that it did not address specific loads on the inverter and did not address the effect on the inverter itself (Section O1.2).

- The inspector identified boric acid crystals on a pipe-to-pipe support weld in the Unit 3 letdown piping. The licensee determined that there was a 5/8-inch crack beneath the boric acid crystals. The licensee's response to the inspector's observations was timely and thorough, and included an inspection in which another crack was identified (Section O2.1).

- The licensee's Schedule 10 piping inspection initiative was good. However, the justification for limiting the initial scope of the Schedule 10 piping inspections to the charging pump suction piping was weak, in that it did not consider the potential for the same types of problems in the equally-vulnerable letdown system piping (Section O2.1).

- Station Technical's evaluation of the plant response to a major grid disturbance was timely and sufficiently detailed to assess plant response. This was an example of good support by Engineering (Section E1.1).

- The licensee was proactive in initiating modifications to allow timely cross-connection of Units 2 and 3 emergency diesel generators (EDGs) to improve site safety (Section E2.1).

- The licensee's proposed actions were acceptable in response to the NRC's determination that the shutdown cooling system valve power supplies were undersized (Section E8.1).

- The absence of a radiation monitor drain valve from any piping and instrumentation drawing or procedure represented a lack of configuration control, which the licensee recognized and corrected (Section R2.1).

Plant Support

- Overall, plant chemistry sampling, in the one sample observed, was appropriately performed. However, in one instance personnel attention to detail was observed to be weak (Section R1.1).

- The licensee's identification and corrective actions for a mispositioned radiation monitor drain valve were prompt and appropriate. The bypass flow rendered an important radiation monitor inoperable, but the significance of this condition was mitigated by the availability of other secondary plant radiation monitors (Section R2.1).

- Licensee performance in the Technical Support Center (TSC) during a quarterly emergency preparedness (EP) drill was very good based on correctly recognizing plant problems, taking appropriate actions, and identifying weakness during the post-drill critique (Section P1.1).

Report Details

Summary of Plant Status

Unit 2 operated at essentially 100 percent power throughout the inspection period, with the exception of four short periods of operation at between 75 and 80 percent power to support heat treating and cleaning the circulating water system. The periods of reduced power operation were July 31-August 1, August 9-10, August 16-19, and August 24-25, 1996.

Unit 3 operated at essentially 100 percent power until August 2, 1996, when power was reduced to 1 percent, and the main generator was taken off line to support feedwater heater repairs (see Section O1.1). Following the repairs, power was increased, and the generator was synchronized to the grid. Power was maintained at essentially 100 percent from August 5 until September 7, when power was again reduced for a heat treatment of the circulating water system. At the end of this inspection period, power was at 94 percent and being increased to full power.

A significant grid disturbance occurred on August 10, 1996, that did not significantly disrupt operations at Units 2 or 3 (see Section E1.1).

I. Operations

O1 Conduct of Operations

O1.1 Unit 3 Downpower

a. Inspection Scope (71707)

On August 2-3, 1996, the inspector observed operators downpower and take the main generator off line to support feedwater heater maintenance. The inspector observed the power decrease from about 45 percent power to approximately 1 percent power.

b. Observations and Findings

The control operator (CO) and assistant control operator (ACO) closely monitored indications during the downpower. They communicated frequently and clearly with each other and with other Operations personnel, and frequently referred to applicable procedures, including alarm response procedures, as necessary.

The control room supervisor (CRS) remained in the control room and closely monitored operator actions. The shift superintendent (SS) and the unit superintendent also provided close oversight of the evolution.

In one instance, the CO and ACO diluted the RCS without first obtaining the concurrence of the CRS. The dilution was needed to control axial shape index, and had been predicted by reactor engineering. The CO informed the CRS, who was also in the "at the controls" area adjacent to the dilution controls, after the dilution

had commenced. It was the licensee's practice for operators to obtain prior concurrence from the CRS for reactivity manipulations. However, the CRS was in a position to provide effective oversight. NRC regulations do not require senior reactor operator concurrence of reactivity manipulations by other reactor licensed operators. Although this was not a violation of NRC requirements, it was considered an example of weak communications and command and control.

A feedwater control valve stuck partially open when reactor power was at approximately 8 percent. Operators took prompt action to reduce power to approximately 2 percent and to shift from main feedwater to auxiliary feedwater to avoid tripping the reactor on high steam generator level. This unexpected transient resulted in a power level change of greater than 15 percent within a one hour period, which was not immediately recognized (see Section M8.1).

c. Conclusions

Command and control of the downpower, with the exception of the dilution, were generally consistent with documented licensee management expectations and procedures. Command and control of the dilution were adequate. Operator attention to indications was good. The operators responded promptly and effectively to the transient resulting from the stuck feedwater control valve.

O1.2 Class 1E Inverter 2Y003 Output Voltage Indication

a. Inspection Scope (37551, 71707, and 61726)

The inspector examined the Unit 2 Class 1E inverters and DC equipment rooms.

b. Observations and Findings

On August 5, 1996, at approximately 5:30 a.m., the inspector observed that the output voltage of Inverter 2Y003 indicated approximately 122.5 volts. A placard next to the meter stated that the voltage should be between 118 and 122 volts. The inspector confirmed that indicated output voltages of the other Unit 2 inverters were within the posted ranges.

At approximately 6:10 a.m., the inspector informed the control room operators of the condition, which the operators then confirmed. The inspector observed that TS SR 3.8.7.1 requires the licensee to "verify correct inverter voltage," but that no specific acceptable values are given in the TS or Licensee Controlled Specifications. Operators informed the inspector that the SR had been deleted from Surveillance Procedure SO23-3-3.27.2, "Weekly Electrical Bus Surveillance," Revision 5, which contained a change summary that stated that the voltages are monitored weekly on the Operator Rounds System. The Operator Rounds System Unit 2 Primary ACO Round 23, Item 37, provides minimum and maximum values for the inverter output voltage of 118.0 volts and 122.0 volts, respectively. The inspector confirmed that

this was a surveillance item, and that the meter on the inverter panel was the instrument used to determine the output voltage.

The operators did not initially recognize the 118-122 volts range as the acceptance criteria, but could find no other range in available documentation. The operators checked system operating Procedure SO23-6-17, "Class 120 VAC Vital Bus Power Supply System Operation," Revision 7, and determined that the only voltage range listed was also 118-122 volts. After discussions with the inspector, the operators determined that the range given in the Operator Rounds System, used to satisfy SR 3.8.7.1, appeared to be the acceptance criteria for the surveillance. The Operations and Station Technical Electrical managers stated that this range was not determined by Engineering and did not necessarily bound the operable range of the inverter. The Operations plant superintendent also stated that, in his opinion, the weekly checks did not have to confirm operation within the design limits, and that the determination of "correct voltage" was intended to be more of a gross check for proper function. He also stated that less frequent activities, such as refueling interval calibrations, were the methods used to ensure that the function was consistent with the design.

The operators contacted the STA, who rendered an immediate judgment that the inverter was operable, despite the output voltage being out of the normal range, based on his belief that the inverter could still perform its design function. He contacted the cognizant engineer for the inverters at approximately 7:00 a.m., who also rendered the judgment that the inverter was operable. Based on this feedback, the operators did not enter the actions for TS LCO 3.8.7.

TS SR 3.0.1 states that "failure to meet a Surveillance, whether such failure is experienced during the performance of the Surveillance or between performances of the Surveillance, shall be failure to meet the LCO." Additionally, TS LCO 3.8.7, Action A.1, requires that with one required inverter inoperable, the AC vital bus must be powered from its Class 1E constant voltage source transformer within 2 hours. This action was not taken.

The Operations Manager stated that transferring the inverter loads to the alternate source would result in a less reliable and stable condition than leaving the loads on the inverter, if the inverter was operable. He stated that the SS was prepared to declare the inverter inoperable and take the required action if Station Technical had not judged that the inverter remained operable.

The Updated Final Safety Analysis Report (UFSAR), Section 8.3.1.1.5.A, states that "the inverter power supplies are designed to regulate the steady-state voltage of 120-Vac within $\pm 2.0\%$ at full-power output for a load power factor of 0.8 at a frequency of 60 ± 0.5 Hz." The licensee determined that these values were identical to those in the procurement specification for the inverter.

The Station Technical Electrical manager informed the inspector that the meter on the inverter panel had an accuracy specification of ±3 volts (2 percent of full scale), and that the actual voltage could be within the required range even if that indication was not within the range.

The inspector reviewed the last calibration of the inverter and the meter, per Maintenance Order 92101753, performed in June 1993, and determined that it allowed a ±3.0-volt tolerance for the installed voltmeter, using a meter with a ±0.6-volt accuracy at 120 volts. The actual inverter output voltage was calibrated to 120 ±2.0 volts, also using a voltmeter with a ±0.6-volt accuracy at 120 volts. This resulted in a procedurally-allowed inverter output voltage ranging from 117.4 to 122.6 volts, slightly outside the design range of 117.6 to 122.4 volts. However, the licensee's practice was to leave the inverters set to the middle of the range. For Inverter 2Y003, the output voltage was left at 119.4 volts, which with instrument inaccuracy resulted in an actual output of 118.8 to 120.0 volts, which was within the design range.

At approximately 12:15 a.m. on August 5, test technicians completed taking voltage readings from inside the cabinet using a voltmeter with an accuracy of ±1.1 volts. The licensee confirmed that the output voltages of Class 1E inverters in Units 2 and 3 were within the normal range, and also adjusted the calibration of the voltmeters on the inverter panels.

At 1:30 p.m., Station Technical completed documentation of an operability assessment in AR 960801065. The operability assessment determined that the inverter was operable because "equipment designed to operate on 120 volts nominal is typically designed to operate with a variation of ±10 percent." The operability assessment also considered a National Electric Code requirement for branch circuits to be designed for no more than a 3 percent voltage drop. The inspector observed that the operability assessment did not address the specific loads the inverter supplied nor the effect on the inverter when operating outside of its design range.

At approximately 4:30 p.m. on August 5, the licensee completed a Procedure Modification Permit for Surveillance Procedure SO23-3-3.27.2 to restore the inverter voltage check surveillance to the procedure, and to change the acceptance criteria to 120 ±1.3 volts, using a Fluke with an accuracy of ±1.1 volts. The inspector observed that this revised acceptance criteria was acceptable to demonstrate that the inverter output was within the design specification of the inverter.

In response to this finding, the licensee began an effort to identify surveillances that lacked appropriate specific quantitative or qualitative acceptance criteria, and to verify that bases existed for the acceptance criteria.

c. Conclusions

The licensee failed to declare Inverter 2Y003 inoperable and to take the actions specified by TS LCO 3.8.7, as required by TS SR 3.0.1, after the output voltage was identified as being outside the acceptance criteria for TS SR 3.8.7.1 (documented in the Operator Rounds System). This is a violation of TS SR 3.0.1 (Violation 50-361/96009-01).

Operations management focused on nuclear safety in not wanting to transfer the inverter loads to the alternate source, which was less reliable, as long as the inverter was operable. Management considered the inverter operable based on the judgment of the STA and cognizant engineer.

The licensee determined that the Operator Rounds System, used to accomplish the weekly surveillance test, was not appropriate for the circumstances, in that the acceptance criteria were not clearly understood as being acceptance criteria, and the instrument used, in conjunction with the acceptance criteria, did not have the required accuracy to confirm that the voltage was within the design range. This was a violation of 10 CFR Part 50, Appendix B, Criterion V, which states that "activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instruction, procedures, or drawings. Instructions, procedures, or drawings shall include appropriate quantitative or qualitative acceptance criteria for determining that important activities have been satisfactorily accomplished." This licensee-identified and corrected violation is being treated as a noncited violation, consistent with Section VII.B.1 of the NRC Enforcement Policy (NCV 50-361(362)/96009-02).

The operability assessment documented in AR 960801065 provided some assurance that the loads could tolerate the observed inverter output voltage. However, it was weak in that it did not address specific loads on the inverter and did not address the effect on the inverter itself.

O2 Operational Status of Facilities and Equipment

O2.1 Letdown Pressure Control Valves in Unit 3

a. Inspection Scope (71707 and 71750)

The inspector performed a routine inspection of safety-related and important-to-safety equipment in the radiologically controlled area.

b. Observations and Findings

The inspector observed that letdown pressure regulator Valve 3PV201A was continually cycling and was very noisy. Although the inspector had previously

observed that this valve continually cycled, on this occasion some piping vibration was also detected. The licensee stated that they were working on circuit design changes to minimize the valve cycling.

The licensee's letdown design has two parallel pressure regulator valves. During inspection of pressure regulator Valve 3PV201B, the inspector noted a buildup of boric acid crystals on a pipe-to-pipe support weld, downstream of the valve. The inspector did not observe any moisture in the weld area. The inspector notified the licensee. The licensee cleaned away the crystals and observed an approximate 5/8-inch crack in the weld. The licensee stated that the pipe was stainless Schedule 10 and was not within their ASME Code program, but that a similar crack had been experienced in a charging system line (see NRC Inspection Report 50-361/95-13, 50-362/95-13).

The licensee determined that the leak was not active. The licensee analyzed the boron crystals and determined that they had accumulated over a 4 month period. The inspector observed that a drop would slowly occur at the crack location (less than one drop per day). The licensee performed an operability determination and considered that the system remained operable. The inspector reviewed the operability determination and considered it adequate. The licensee intended to monitor the crack and shut down to repair the weld if a leak of a predetermined rate occurred.

The inspector questioned why the boric acid crystals were not found by licensee system engineering and operations tours. The Operations manager stated that operators usually focused more attention on components that were prone to leakage. He stated that this example would be used to heighten awareness that operators should be more observant of piping conditions.

The inspector questioned the licensee regarding current maintenance program for this piping. Licensee engineering personnel stated that a plan for identification and inspection of Schedule 10 piping, on the suction side of the charging pumps, had been initiated following a crack previously identified in that piping (see NRC Inspection Report 50-361/95-13, 50-362/95-13). As the letdown crack was outside of that scope, the licensee intended to reassess the inspection scope as appropriate. The schedule and scope of piping inspections had not been revised by the end of this inspection period. The original scope was limited to safety-related piping. The letdown system is not safety-related, but is operationally important and classified as important to safety.

A similar crack was identified on another welded support on same letdown pipe, but in an infrequently accessed high radiation area/high contamination area, during a followup inspection by the licensee, accompanied by the inspector, on September 5, 1996.

c. Conclusions

The licensee's response to the inspector's observations was timely and thorough.

A weakness in the performance of operator rounds was identified as the result of operators not identifying the 4-month old boric acid buildup in an easily accessible, well lighted area.

The licensee's Schedule 10 piping inspection initiative was good. However, the justification for limiting the initial scope of the Schedule 10 piping inspections to the charging pump suction piping was weak, in that it did not consider the potential for similar types of problems in the equally-vulnerable letdown system piping.

O5 Operator Training and Qualification

O5.1 Simulator Training

a. Inspection Scope (41500)

The inspector observed an evaluated simulator scenario. The scenario, which was conducted as planned, involved loss of a circulating water pump, a rapid downpower, and a steam generator tube rupture with concurrent loss of all feedwater.

b. Observations and Findings

Operators appeared to satisfactorily perform all expected actions and behaviors. Communications were clear, and the command and control function was well-executed. Abnormal operating procedures and emergency procedures were followed.

c. Conclusions

The simulator scenario sufficiently exercised operator skills to allow effective evaluation of their performance. Operators performed as expected, with no deficiencies observed by the inspector.

O8 Miscellaneous Operations Issues (92901)

O8.1 (Closed) Violation 50-361(362)/96002-01: failure to comply with TS administrative requirements for procedure reviews. The initial violation consisted of two examples, one for failure to perform TS division management review of certain temporary change notices (TCNs) prior to implementation and the second for failure to perform TS division management review of certain abnormal alignments, which were considered by the NRC as being test evolutions, prior to implementation.

The licensee did not believe that either example constituted a violation, as noted in its letter to the NRC dated May 20, 1996. By letter dated July 19, 1996, the NRC withdrew the first example concerning review of TCNs and retained the second example concerning the abnormal alignments.

a. Inspection Scope

The inspector reviewed the Notice of Violation, licensee and NRC letters, and licensee corrective actions and enhancements.

b. Observations and Findings

Although the first example of the Notice of Violation was withdrawn, the licensee's review of the administration of its TCNs indicated areas where enhancements could be made. The licensee listed these enhancements in their May 20, 1996, letter. The inspector reviewed the enhancements and considered that they were proactive in improving the administration of TCNs.

Licensee representatives stated that they planned to accept the NRC conclusion that the second example constituted an evolution, which would have required prior division management approval. The licensee changed the program to include division management approval of abnormal alignments which perform test evolutions. The inspector confirmed that the program had been changed.

The inspector reviewed the abnormal alignments cited in the second example with the licensee, including the safety evaluation contained in Abnormal Alignment 2-95-138, concerning operation of a high pressure safety injection (HPSI) pump to test check valves. The licensee noted that the safety evaluation had specifically evaluated pump flow requirements and took steps (by opening the bypass flow valves) to ensure that the pump vendor operating limits were not exceeded. Because the procedure required that the by-pass flow valve be open, the licensee considered that there was no safety significance with the examples cited, from the standpoint of the potential to damage the HPSI pump. The inspector acknowledged that the licensee procedure operated the HPSI pump within its operating limits.

The licensee also discussed the development of the cited abnormal alignments and how the licensee had evaluated the potential for over-pressurization of the low pressure safety injection piping. The licensee acknowledged the observation, in Inspection Report 50-361(362)/95-07, that the potential for over-pressurization existed. The inspector noted that the licensee understood the safety significance of the over-pressurization potential and had incorporated the over-pressurization mitigation strategy into the applicable procedure.

II. Maintenance

M1 Conduct of Maintenance

M1.1 General Comments

a. Inspection Scope (62703)

The inspector observed all or portions of the following work activities:

	MO Number	Description
•	96080723000	replace Unit 2 plant vent stack wide range gas Monitor 2RY7865-1 grab sample timer
•	96080242000	clean and inspect component cooling water Heat Exchanger 2ME001
•	94080807000	monitor current at HPSI Pump 3P017 breaker

b. Observations and Findings

The inspectors found the work performed under these activities to be thorough and proper. All work observed was performed with the work package present and in active use. Technicians were knowledgeable and demonstrated the skills necessary for the work. When applicable, appropriate radiation controls were in place.

M1.2 General Comments on Surveillance Activities

a. Inspection Scope (61726)

The inspector observed all or portions of the following surveillance activity:

- Monthly Fuel Handling Building Post-Accident Air Cleanup System Test"(Unit 2)

b. Observations and Findings

The inspectors found the surveillance performed under this activity to be thorough. The surveillance was performed with the procedure present and in active use. The technicians were knowledgeable and demonstrated the skills necessary for the work.

In addition, see the specific discussion of a surveillance observed under Section M3.1 below.

M2 Maintenance and Material Condition of Facilities and Equipment

M2.1 General Plant Conditions

a. Inspection Scope (71707 and 71750)

The inspectors performed walkdowns in most accessible plant areas.

b. Observations and Findings

The inspectors observed approximately 20 indications of minor boric acid leaks and similar deficiencies that were not identified with deficiency tags. The licensee did not require deficiency tags to be hung, and approximately half of the deficiencies were already in the licensee's corrective action system. The licensee entered the others into the corrective action system. The number of deficiencies was about twice the number identified by NRC personnel in recent months. None of the identified deficiencies appeared to impact equipment operability.

The licensee monitored the numbers of drip bags on a weekly bases. As of August 29, 1996, only 14 drip bags were installed in Units 2 and 3.

c. Conclusions

Minor deficiencies were generally being identified by the licensee, although some were not. The increase in the number of inspector-identified deficiencies indicates a slight negative trend in material condition. However, the overall material condition, with respect to boric acid leaks, was very good and was being well managed.

M3 Maintenance Procedures and Documentation

M3.1 Maintenance Rule Status Report Review

a. Inspection Scope (62707)

The inspector reviewed a July 1996 Monthly Maintenance Rule status report, issued by a licensee memorandum dated August 19, 1996; 10 CFR 50.65, "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," (the Maintenance Rule); NUMARC 93-01, May 1993, "Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants;" NRC Regulatory Guide 1.160, "Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," which endorsed the NUMARC guidance; and NRC Inspection Report 50-528/9609 containing the results of a Maintenance Rule implementation inspection conducted at Palo Verde Nuclear Generating Station. The inspector met with licensee personnel on September 6, 1996.

b. Observations and Findings

Section (a)(2) of the Maintenance Rule requires a normal level of monitoring of structures, systems, or components (SSCs) "where it has been demonstrated that the performance or condition of the SSC is being effectively controlled through the performance of appropriate preventive maintenance, such that the SSC remains capable of performing its intended function."

Section (a)(1) of the Maintenance Rule requires licensees to "monitor the performance of SSCs against licensee-established goals, in a manner sufficient to provide reasonable assurance that such SSCs . . . are capable of fulfilling their intended functions. Such goals shall be established commensurate with safety and, where practical, take into account industry-wide operating experience. When the performance or condition of a SSC does not meet established goals, appropriate corrective action shall be taken."

The inspector observed that the licensee status report indicated that 15 SSCs had exceeded performance criteria as monitored per Section (a)(2) of the Maintenance Rule. The licensee determined that these SSCs exceeded the criteria, based on either availability or functional failures or repetitive failures during the last four calendar quarters prior to July 10, 1996 -- the date of required implementation of the Maintenance Rule. The licensee had generated ARs to Station Technical personnel to evaluate goals for these SSCs. The inspector requested that the licensee provide the goals for these SSCs per Section (a)(1) of the Maintenance Rule. As of September 6, 1996, the licensee stated that they had not completed goal-setting evaluations for the 15 SSCs. The licensee informed the inspector that the goals for each of these SSCs were the same as the performance criteria being used per Section (a)(2) of the Maintenance Rule. The ARs generated were meant to enhance this generic goal. For example, the goal for an SSC would be no more functional failures, until the SSC met the performance criteria of no more than three functional failures for a defined time period, given that the SSC had already experienced the three functional failures.

The licensee did not have procedural guidance for the timeliness of the goal-setting evaluations. The Station Technical manager stated that his expectation was that the goal setting would be completed within 30 days from the time the determination was made that a component or system was in (a)(1), but that the first round of goal setting would take longer to ensure that it was properly accomplished. The licensee recognized the vulnerability to criticism if additional functional failures occurred before goals were set and enhanced monitoring implemented.

The inspector observed the following concerning requirements for goals under Section (a)(1) of the Maintenance Rule (with the basis in parenthesis):

- A cause determination is required when a SSC does not meet performance criteria. Goals may be at the system, train, component, or structure level,

depending on the cause determination. Monitoring of SSC performance against these goals should be based on the availability of plant specific or industry data, and should allow for early detection of negative trends (NUMARC guidance).

- If performance criteria are not met, the basis for the criteria should be reviewed to determine if goal setting is required and the appropriate goal value established. It should be recognized that while goals and performance criteria may have the same value and units, goals are only established under (a)(1) where performance criteria are not being met and are meant to provide reasonable assurance that the SSCs are proceeding to acceptable performance (NUMARC guidance).

- Cause determination results and performance against the Section (a)(1) goals should be documented (NUMARC guidance).

Based on the above, the inspector found that for each SSC the licensee identified as not meeting performance criteria per Section (a)(2), the licensee was required to develop a cause determination and set goals under Section (a)(1), based on that cause as outlined above. In some instances it may have been appropriate to use the performance criteria as the goal.

This issue was unresolved at the end of this inspection period. To resolve this issue the inspector will evaluate each of the SSCs that the licensee identified as not meeting performance criteria for the appropriateness and timeliness of the licensee's actions, given that the Maintenance Rule was to be fully implemented on July 10, 1996 (Unresolved Item 50-361(362)/96009-03).

M3.2 Erroneous Surveillance Data Not Noted by Licensee Personnel

a. Inspection Scope (61726)

On August 30, 1996, the inspector reviewed completed Instrumentation Procedure SO23-II-5.8, Revision 12, "SR N.I. Safety Channel D Drawer Test Linear Power Subchannel Gains Functional Test and Channel Calibration." This TS-required surveillance had been completed by I&C technicians on Unit 3 Safety Channel D on August 27, 1996. On September 5, 1996, the inspector interviewed the two I&C technicians who performed the surveillance.

b. Observations and Findings

The inspector observed that Step 6.6.4 of the surveillance procedure, to record the output power meter reading of the linear power amplifier when a test switch was positioned to insert a test signal to the input of the amplifier, was recorded as an actual meter reading outside of acceptance criteria listed in the same step. The acceptance band for the meter was 5.0 E-4 to 1.2 E-3 percent power, and the

actual meter reading recorded was 8.0E-6 percent power. The inspector informed I&C supervision and the shift supervisor, and observed that this out-of-specification parameter had not been previously reconciled by licensee personnel. After the surveillance was completed on August 27, 1996, the I&C technicians reported to the control room operators that the instrument, in regards to gain on the amplifier, was satisfactory. I&C supervision had not yet reviewed the complete surveillance procedure as of August 30, 1996, although two reviews were indicated as required by signature block. Programmatically, there was no time requirement for completion of these reviews when the surveillance was being performed to fulfill the normal SR. The technicians performing the surveillance would review the completed surveillance themselves and then inform the control room operators of any unsatisfactory parameters.

In response to the inspector's observation, the shift supervisor declared the channel inoperable because of unsatisfactory performance of this surveillance. The channel had previously been declared inoperable for unrelated reasons (an excessive number of spurious trips). On August 30, 1996, the licensee performed this portion of the surveillance again, and recorded a satisfactory meter reading. Based on this and the interviews of the technicians involved, the inspector found that the meter reading had actually been satisfactory on August 27, 1996, that the technicians had not recorded the actual meter reading properly, and had failed to note this prior to informing the control room operators that the amplifier gains were satisfactory.

c. Conclusions

The inspector found that this situation had no safety consequence since the gain was actually satisfactory and the technician had observed the meter to be reading within acceptance criteria but had mistakenly recorded the in-specification parameter as out-of-specification. The I&C technicians, in this instance, demonstrated inattention to detail by recording a meter reading erroneously.

M8 Miscellaneous Maintenance Issues (90712)

M8.1 (Closed) Licensee Event Report (LER) 50-362/96003-00: delinquent iodine sample analysis following 15 percent power change in one hour period. At approximately 4 p.m. on August 3, 1996, during a review of data from a planned downpower of Unit 3 (see Section O1.1), the licensee determined that an SR had been missed because operators had failed to recognize that power had been decreased by greater than 15 percent in 1 hour. SR 4.4.7 (Table 4.4-4) requires than the RCS be sampled and analyzed for iodine between 2 and 6 hours following a change of power in excess of 15 percent in a 1-hour period. The licensee determined that power had been decreased by approximately 16 percent between 3:15 a.m. and 4:15 a.m. on August 3, 1996.

A routine chemistry sample had been taken at 8:30 a.m., but had not been analyzed promptly for iodine. The licensee analyzed this sample, and obtained and analyzed another sample, with no unexpected results. During the downpower, which the inspector had observed, an unexpected transient occurred that resulted in power being quickly reduced by about 6 percent. The operators were paying close attention to their indications and were logging power level every 30 minutes as required by procedures. However, this manual log did not reveal that power had changed by more than 15 percent in 1 hour, which was evident from the subsequent review of power level graphs. Additionally, due to the level of activity following the transient, the SS did not immediately request a review of the power history to confirm compliance with the TS. The licensee initiated AR 960800223 and a Level 2 event report to investigate the event and to document additional corrective actions. This licensee-identified and corrected violation is being treated as a noncited violation, consistent with Section VII.B.1 of the NRC Enforcement Policy (NCV 50-362/96009-04).

III. Engineering

E1 Conduct of Engineering

E1.1 Grid Disturbance (37551)

Plant response to the major grid disturbance on August 10, 1996, was as designed. Two steam bypass control valves opened briefly, and the core operating limits supervisory systems stopped automatic calculations, as a result of the transient. The initial voltage sag was approximately 10 percent, resulting in degraded voltage flags on the Class 1E 480 volt buses. Station Technical completed an evaluation of the plant response on August 14, confirming that the plant response was as designed.

Conclusions

The inspector concluded that Station Technical's evaluation of the plant response was timely and sufficiently detailed to assess plant response. This was an example of good support by engineering.

E2 Engineering Support of Facilities and Equipment

E2.1 On-site Emergency Power (37551)

One of the items simulated during the quarterly EP drill on August 7, 1996, was loss of offsite power and failure of EDGs in Unit 2 to start. Both EDGs in Unit 3 were simulated to start. Simulated Unit 2 plant conditions deteriorated due to lack of electrical power.

Currently, interlocks exist which prevent any timely connection of EDGs in one unit to the other unit. During past inspections, the inspector had discussed with licensee engineering and probabilistic risk assessment personnel whether being able to cross-connect EDGs between units provided a safety benefit. The licensee studied the benefits of having EDGs available to support the opposite unit and had recently concluded that the improvement in safety warranted making the necessary hardware and procedure modifications. The licensee noted that the associated design change was in the review process.

Conclusions

The inspector considered that the licensee was proactive in initiating modifications to allow timely cross-connection of Units 2 and 3 EDGs to improve site safety.

E2.2 Review of Facility and Equipment Conformance to UFSAR Description (37551)

A recent discovery of a licensee operating its facility in a manner contrary to the UFSAR description highlighted the need for a special focused review that compares plant practices, procedures and/or parameters to the UFSAR descriptions. While performing the inspections discussed in this report, the inspectors reviewed the applicable sections of the UFSAR that related to the inspection areas inspected. The inspectors verified that the UFSAR wording was consistent with the observed plant practices, procedures and/or parameters.

E8 Miscellaneous Engineering Issues (92903)

E8.1 (Closed) Unresolved Item 50-361(362)/95201-01: adequacy of shutdown cooling valve power. Due to equipment substitutions made during construction, which rendered the electrical supply equipment undersized, the licensee found that fuses which supplied power to these valves occasionally blew during initial valve stroking. The licensee's corrective action was to install two pre-wired spare fuses and a selector switch for each circuit. In NRC Inspection Report 50-361(362)/95-201, the NRC noted that the modification required operator action to locally select the spare fuses and considered that the modification may have increased the likelihood of equipment failure when compared to the original design.

In a letter dated July 12, 1996, the NRC informed the licensee that the design did not comply with industry guidance, but that the design did provide an acceptable level of safety until a permanent solution could be implemented.

In a letter dated August 26, 1996, the licensee committed to make a permanent design change during each unit's Cycle 10 refueling outage.

The inspector reviewed the circuit design, fuse failure records, and associated NRC and licensee letters. The inspector noted that the licensee's August 26, 1996,

letter provided several options for a permanent change, which appeared to address correction of the problem.

Conclusions

The NRC determined that the existing design provided an acceptable level of safety, and that the licensee's actions did not constitute a violation of NRC requirements.

IV. Plant Support

R1 Radiological Protection and Chemistry Controls

R1.1 Sampling and Chemistry

a. Inspection Scope (71750)

The inspector performed a review of secondary water activity analysis and radiation monitor alarm status, a review of selected plant chemistry results against TS and procedural limits, and observed portions of reactor coolant and oxygen samples taken from Units 2 and 3.

b. Observations and Findings

The inspector verified that secondary water activity analysis results were below action levels and that radiation monitors did not indicate degradation of steam generator tube integrity. The inspector also reviewed sample results for RCS total activity and dose equivalent iodine, which were below licensee procedural and TS limits. The inspector observed RCS sampling performed by chemistry personnel and considered that, overall, the activities were conducted in accordance with procedural controls. However, while obtaining a Unit 2 RCS sample, the chemistry technician appeared to bypass two steps in Sampling Procedure SO23-III-1-6-23, Revision 12, "Units 2/3 - Normal Operation of the Reactor Coolant Sample System," as he turned to another page. When the inspector questioned the technician regarding the steps, the technician acknowledged the validity of the inspector's observation and subsequently performed the steps. However, had the omission occurred, the result would have been negligible as the steps were only necessary to depressurize the sampling lines to a sample vessel prior to the sample vessel's removal from the sample sink.

Sampling results were reviewed and found to be below any action levels.

c. Conclusions

Overall, plant chemistry sampling was appropriately performed. However, in one instance personnel attention to detail was observed to be weak.

R2 Status of Radiological Protection and Chemistry Facilities and Equipment

R2.1 Steam Generator Blowdown Radiation Monitor Valve Alignment (Unit 3)

a. Inspection Scope (71750)

The licensee identified and reported, in AR 960800600, that an undocumented valve was found open, which effectively bypassed the sample flow for Steam Generator 3E088 Blowdown Radiation Monitor 3RE6759. The valve was not identified on any piping and instrumentation drawing or in any procedure. The inspector reviewed the AR and discussed the issue with cognizant licensee personnel. The inspector also reviewed the licensee's emergency operating procedures.

b. Observations and Findings

The licensee determined that the condition rendered the radiation monitor inoperable, but that the condition was not reportable. The flow switch for the sample flow was upstream of the opened valve, so the bypass flow was not able to be detected by the flow switch. The basis for this was that the monitor is not required by the TS, and that other means existed for monitoring radioactivity in the secondary side of the steam generators. The inspector determined that this was accurate.

The licensee was unable to determine when or how the valve was mispositioned. The licensee promptly checked the drain valves on other secondary plant radiation monitors and determined that they were properly positioned.

The licensee determined that the valves were not needed and initiated action to remove the valves.

The inspector reviewed the licensee's Emergency Operating Instructions SO23-12-1, "Standard Post Trip Actions," Revision 12, and SO23-12-4, "Steam Generator Tube Rupture," Revision 13, and determined that this blowdown radiation monitor was one of six monitors used to detect radiation levels and trends in the secondary plant. The inspector observed that because of the lag time in this monitor, it would generally be the secondary or tertiary indication of secondary plant radioactivity. The inspector also observed that the steam generator blowdown radiation monitors (one per generator) were the only secondary plant radiation monitors that would be available after a main steam isolation actuation. Additional review to determine the potential importance of the steam generator blowdown radiation monitor on event diagnosis will be conducted (Followup Item 50-362/96009-05).

c. Conclusions

The licensee's identification and corrective actions for the mispositioned radiation monitor drain valve were prompt and appropriate. The bypass flow rendered an important radiation monitor inoperable, but the significance of this condition was mitigated by the availability of other secondary plant radiation monitors. However, this could have negatively impacted the accuracy and timeliness of event diagnosis.

The absence of the drain valve from any piping and instrumentation drawing or procedure represented a lack of configuration control, which the licensee recognized and corrected.

This issue will be further reviewed as a followup item to address the potential significance of the inoperability of this monitor and the affect on event prognosis.

P1 Conduct of EP Activities

P1.1 Quarterly EP Drill

a. Inspection Scope

The inspector witnessed the activities within the TSC during the quarterly EP drill on August 7, 1996. The drill included loss of the Emergency Operations Facility and management of activities from the TSC.

b. Observations and Findings

The inspector observed that the licensee staff correctly recognized the scope of each problem and followed their emergency procedures to address these problems. Emergency Action Levels were correctly determined. The licensee's Station Emergency Director maintained overall control of the TSC, focused only on major issues, and provided clear directions to support staff. However, the inspector observed a few deficiencies, including radio transmissions that were not received, poor communications related to determining inside containment radiation readings, and the failure of some personnel to listen to the periodic briefings. After the drill licensee management personnel independently identified these weaknesses and assigned corrective actions. Two aspects of the drill are discussed in Sections E2.1 and P1.2.

c. Conclusions

Licensee performance in the TSC was very good based on correctly recognizing plant problems, taking appropriate actions and identifying deficiencies during the post-drill critique.

P1.2 Containment Radiation Monitors

The licensee had determined that the in-containment radiation monitors in both units were inoperable due to susceptibility of cable connectors to moisture intrusion. As discussed in LER 50-361(362)/96-005, the licensee had established an alternate means of determining in-containment radiation readings as required by the new standard TS 3.3.3.1. The alternate means consisted of taking outside-containment radiation readings and estimating the in-containment readings using pre-prepared charts.

During the EP drill on August 7, 1996, outside-containment radiation readings were taken, and assigned personnel located and utilized the charts to determine in-containment radiation readings and to assess core damage. However, the managers and other key personnel in the TSC did not know that the charts had been located and were being used, so the Station Emergency Director was never provided with any estimates of in-containment radiation readings. At the post-drill critique, licensee personnel stated that the charts were available and that they would ensure that cognizant TSC personnel had access to the charts.

The inspector briefly reviewed the charts and noted that they did not consider the effects of containment spray. On August 14, 1996, the licensee issued a Memorandum for File, "Core Damage Estimation Based on Dose Rate at Containment Outside Surface." The inspector will review the technical adequacy of this memorandum as part of the followup of LER 50-361(362)/96-005.

V. Management Meetings

X1 Exit Meeting Summary

The inspectors presented the inspection results to members of licensee management at the exit meeting on September 10, 1996. The licensee acknowledged the findings presented.

At the exit meeting, the licensee informed the inspectors that a more rigorous operability assessment for the Class 1E inverter (Section O1.2) had been completed, concluding that Inverter 2Y003 was operable (able to perform its design function) with an output voltage of 122.5 volts. The assessment did not support the inverter being operable for the 120 volts ± 10 percent, discussed in the original operability determination.

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

D. Brieg, Manager, Station Technical
J. Clark, Manager, Chemistry
J. Fee, Manager, Maintenance
G. Gibson, Manager, Compliance
R. Krieger, Vice President, Nuclear Generation
D. Nunn, Vice President, Engineering and Technical Services
T. Vogt, Plant Superintendent, Units 2 and 3
R. Waldo, Manager, Operations

INSPECTION PROCEDURES USED

IP 37551:	Onsite Engineering
IP 41500:	Training and Qualification Effectiveness
IP 61726:	Surveillance Observations
IP 62707:	Maintenance Observation
IP 71707:	Plant Operations
IP 71750:	Plant Support Activities
IP 90712:	In-Office LER Review
IP 92901:	Followup - Operations
IP 92903:	Followup - Engineering

ITEMS OPENED AND CLOSED

Opened

50-361/96009-01	VIO	failure to declare component inoperable when SR was not satisfied (Section O1.2)
50-361/96009-03 50-362/96009-03	URI	maintenance rule implementation - goal setting (Section M3.1)
50-362/96009-05	IFI	importance of the steam generator blowdown radiation monitor on event analysis (Section R2.1)

Opened and Closed

50-361/96009-02 50-362/96009-02	NCV	inadequate surveillance procedure (Section O1.2)
50-362/96009-04	NCV	delinquent surveillance for RCS iodine sample following power change greater than 15 percent (Section M8.1)

Closed

50-361/95201-01 50-362/95201-01	URI	adequacy of shutdown cooling valve power (Section E8.1)
50-361/96002-01 50-362/96002-01	VIO	failure to comply with TS administrative requirements for procedure reviews (Section O8.1)
50-362/96003-00	LER	delinquent iodine sample analysis following 15 percent power change in one hour period (Section M8.1)

LIST OF ACRONYMS USED

ACO	assistant control operator
AR	action request
CO	control operator
CRS	control room supervisor
EDG	emergency diesel generator
EP	emergency preparedness
HPSI	high pressure safety injection
I&C	instrumentation and control
LCO	limiting condition for operation
LER	licensee event report
MO	maintenance order
PDR	Public Document Room
RCS	reactor coolant system
SR	surveillance requirement
SS	shift superintendent
SSC	structure, system, or component
STA	shift technical advisor
TCN	temporary change notice
TS	Technical Specification
TSC	technical support center
UFSAR	Updated Final Safety Analysis Report