U. S. NUCLEAR REGULATORY COMMISSION

REGION V

Report Nos.: 50-206/93-01, 50-361/93-01, and 50-362/93-01

Docket Nos.: 50-206, 50-361, and 50-362

License Nos.: DPR-13, NPF-10, and NPF-15

Licensee: Southern California Edison Company
Irvine Operations Center
23 Parker Street
Irvine, California 92718

Facility Name: San Onofre Units 1, 2, and 3

Inspection at: San Onofre, San Clemente, California

Inspection Dates: January 11 through January 29, 1993

Inspectors: D. Acker, Reactor Inspector

F. Gee, Reactor Inspector

Approved by: W. P. Ang, Engineering Section Chief — 2-25-93 Date Signed

Inspection Summary:

Inspection during the period from January 11 through January 29, 1993 (Report Nos. 50-206/93-01, 50-361/93-01 and 50-362/93-01)

Areas Inspected:

The areas inspected in this announced routine engineering inspection included design changes and plant modifications, and follow-up of previously identified inspection items. Inspection Procedures 37700, 92700, 92701, and 92702; and Temporary Instruction 2515/111, "Electrical Distribution Functional Inspection Followup," were used as guidance for this inspection.

Safety Issues Management System (SIMS) Item:

None

Results:

General Conclusions and Specific Findings:

The licensee had been making adequate progress in resolving open items.

The licensee issued a calculation for emergency diesel generator on-site diesel fuel oil storage requirements which did not correct an error specifically noted in a January 12, 1990 NRC inspection report.

The licensee had not updated a system description, as directed by a minor modification package.

Significant Safety Matters:

None

Summary of Violation or Deviations:

One violation of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Actions," was identified in Section 4.i.

Open Items Summary:

The inspectors closed 27 open items and opened one (See Section 4.6).

Details

1. Persons Contacted

Southern California Edison Company

*D. Axline, Engineer, Onsite Nuclear Licensing
*D. Breig, Manager, Station Technical
*B. Carlisle, Supervisor, Nuclear Engineering Design Organization
*G. Desin, System Design Engineer
*M. Herschthal, Assistant Manager, Station Technical
*J. Jamerson, Lead Engineer, Onsite Nuclear Licensing
*M. Jones, Assistant Plant Superintendent
*B. Katz, Manager, Nuclear Oversight
*R. Krieger, Station Manager
*M. Lewis, Supervisor, Radioactive Material Control
*S. Paranandi, Supervisor, Quality Assurance
*J. Reeder, Manager, Nuclear Training Division
*J. Reilly, Manager, Nuclear Engineering and Construction
*D. Rosenblum, Manager, Nuclear Regulatory Affairs
*M. Short, Manager, Site Technical Services
*R. St. Onge, Supervisor, Nuclear Engineering Design Organization
D. Stickney, Supervisor, Nuclear Engineering Design Organization
*J. Thomas, Safety Engineer
*J. Vanderbroek, Onsite Nuclear Licensing
*D. Wilcockson, Engineer, Onsite Nuclear Licensing
*T. Yackle, Nuclear Engineering Design Organization

San Diego Gas and Electric

*R. Erickson, Site Representative

Nuclear Regulatory Commission

*G. Johnston, Examiner
*D. Solorio, Resident Inspector

The inspectors also held discussions with other licensee and contractor personnel during the course of the inspection.

*Denotes those attending the exit meeting on January 29, 1993.

2. Design Changes and Modifications (37700)

The 1989 NRC electrical distribution system functional inspection identified that inadequate starting air receiver pressure existed for the diesel generators. The diesel air start capacity, at the time of that inspection, was not sufficient for five starts.

The licensee implemented a design change package (DCP) 2/3 -6818.00SM, "Modification of Diesel Generator Starting Air System," Revision 0, to add additional air start capacity. The licensee added two air receivers

to each diesel generator set (four air receivers per unit) and replaced the existing four compressors of each unit with four higher capacity compressors in Units 2 and 3. Each of the new receivers added a volume of approximately 120 cubic feet to the existing receiver of 64 cubic feet.

The inspector reviewed the DCP and the post modification testing results and walked down the installation in both Units 2 and 3. The licensee had verified that the total capacity of the new and existing receivers was capable of cranking a diesel engine five times, starting at a receiver pressure of 170 psig or less, without recharging the receiver. Each cranking cycle duration was observed by the licensee during the post modification testing to be approximately three seconds and two or three engine revolutions. Each compressor was capable of completely recharging its air receivers from 120 psig (minimum cranking pressure) to 185 psig within 30 minutes. The compressor started and stopped at receiver pressures of 185 and 200 psig, respectively. The inspector concluded that the licensee has taken adequate corrective actions in meeting the air capacity design requirement of five starts. In addition, the inspector also concluded that the licensee prepared and installed the design change package adequately.

No violations or deviations from NRC requirements were noted in the areas inspected.

3. Onsite Followup of Written Reports (92700)

(Closed) Licensee Event Report 50-206/90-09-L0: Check Valves Not Tested in Accordance with Inservice Test Requirements

Licensee's Report

Licensee Event Report 50-206/90-09, Revision 0, reported that seat leak testing, required to be performed by the SONGS inservice test (IST) program, had not been performed for six secondary Chemical Feed system check valves in Unit 1.

Licensee's Actions

The licensee tested the six check valves per IST requirements and performed a root cause evaluation of the problem. The licensee determined that there were programmatic causes for this failure which applied to all three units. The licensee determined that informal routing of IST program changes contributed to the problem. The licensee committed to initiate a formal tracking system for IST program changes.

The licensee committed to review their entire IST program to ensure that components that were required to be tested were being tested.

Inspectors' Actions During the Present Inspection

The inspectors reviewed the IST records of the six check valves and determined that they had been tested. The inspectors reviewed Procedure SO123-V-5.15, Revision 5, "Inservice Testing (IST) Coordination and Trending," and determined that this procedure contained a documented tracking system for IST program changes. The inspectors selected several IST program changes and verified that feedback notices had been signed and returned stating that the changes had been received. The inspectors discussed IST requirements with the licensee. The inspectors also verified that recently installed relief valves, which required IST, had been included in the IST program and properly tested.

Discussion and Conclusion

The licensee stated that long term IST changes were being made due to their decision to incorporate updated IST requirements during the second 120 month IST program cycle, as discussed in 10 CFR Part 50, Section 55a. The licensee had assigned a target date of 1996 to complete the planned actions.

Based on satisfactory completion of the reviews discussed above, the inspectors concluded that the licensee's immediate actions were adequate. Based on completion of these actions and the long term commitment to change and upgrade the IST program during the next 120 month IST cycle, the inspectors concluded that this LER was adequately resolved for all three units. This item is closed.

4. Previously Identified Open Items (92701)

a. (Open) Unresolved Item 50-361, 50-362/88-10-03: Review of Electrical System Analysis Using ASDOP Computer Program

Original NRC Open Item

The inspectors noted that the licensee had not established the adequacy of the alternating current (ac) voltage system. At the time of that inspection, the licensee stated that they would evaluate the ac voltage system adequacy by use of a computer program called ASDOP.

Licensee's Actions in Response to the Open Item

Subsequently, the licensee decided not to use the ASDOP program for electrical analysis. The licensee performed voltage drop and short circuit studies of the ac voltage system using a Bechtel software program titled, "Bechtel Electrical Computer Analysis Package," (BECAP). The licensee used the BECAP program to accomplish Calculations E4C-090, Revision 0, "Aux. System Voltage Regulation," and E4C-092, Revision 0, "Short Circuit Studies."

Inspectors' Actions During the Present Inspection

The inspectors reviewed Calculations E4C-090 and E4C-092, input data for these calculations, and sample hand calculations.

Discussion and Conclusion

The inspectors determined that Calculation E4C-090 indicated voltages to selected loads could be above or below their design operating values under design bases conditions. The licensee stated that they were attempting to resolve the design voltage problems indicated in Calculation E4C-090 by keeping tighter regulation on the off-site power grid, but that action was still pending. The licensee also stated that operators were monitoring for high voltages during shutdown low load conditions.

The inspectors determined that Calculation E4C-092 indicated that worst case short circuit fault current was above the ratings of certain safety-related 480 volt ac breakers. The licensee stated that they were also attempting to resolve the short circuit design problems by keeping tighter regulation on the off-site power grid. The inspectors determined that the worst case fault current conditions would occur with an EDG in parallel with the grid, a condition which normally existed for only one hour a month.

The inspectors determined that Calculation E4C-090 assumed only a three percent voltage drop from motor control centers (MCCs) to loads. The inspectors considered that this was not a conservative value, and could be substantially exceeded for loads not located adjacent to their associated MCC. The licensee stated that use of the three percent was an unverified design assumption. The licensee noted that they were in the process of performing motor operated valve calculations which would individually determine voltage drops from the MCCs to the motor operated valves.

The inspectors determined that Calculations E4C-090 and E4C-092 used the same input data for cable resistances taken at 75 degrees Celsius (C). Although the 75 degree C data was conservative for voltage drop studies in Calculation E4C-090, it was non-conservative for the short circuit studies of Calculation E4C-092. The inspectors discussed this issue with the licensee, who agreed. The licensee performed sample calculations which indicated that the potential worst case fault current would be increased by less than 1 percent with cables at 25 degrees C. The licensee agreed to use lower cable temperatures in future short circuit calculations.

The inspectors reviewed sample calculations which provided similar results to the BECAP program, however, the inspectors did not attempt to validate this program.

The inspectors concluded that although Calculations E4C-090 and E4C-092 indicated design bases problems, none of the results

indicated an immediate operational concern. However, this item will remain open pending licensee resolution of design issues involving these calculations, including MCC load voltage drops, and further staff review of the applicability of the BECAP program to provide adequate results.

b. (Closed) Unresolved Item 50-361, 50-362/88-10-10: Non-Conservative Emergency Diesel Generator Dynamic Loading Analysis

Original NRC Open Item

The inspectors determined that the Updated Final Safety Analysis Report (UFSAR) committed to Regulatory Guide (RG) 1.9, "Selection, Design, and Qualification of Diesel-Generator Units Used as Onsite Emergency Power Systems at Nuclear Power Plants." The inspectors determined that the dynamic loading of the EDGs, as determined by the licensee based on vendor testing, might not be conservative with respect to actual transient loads on the EDGs during design bases accidents. If the testing did not represent actual dynamic loading and no associated calculation existed, then the licensee would be in deviation of the UFSAR commitment to RG 1.9.

Licensee's Actions in Response to the Open Item

The licensee performed Calculation E4C-082, Revision 0, "System Dynamic Voltages During Design Basis Accident." The licensee reviewed the results of this calculation against the EDG testing done by the vendor and testing done by the licensee per Technical Specification (TS) requirements. The licensee concluded that the original vendor EDG testing had not completely enveloped the dynamic loads on the EDGs, but that the differences were slight.

The licensee concluded that the original vendor test data, Calculation E4C-082, and TS testing indicated that the dynamic response of the EDGs was well within the RG 1.9 criteria for dynamic response of the EDGs to accident loading.

Inspectors' Actions During the Present Inspection

The inspectors reviewed the vendor test data, Calculation E4C-082, RG 1.9, the UFSAR, and the licensee's conclusions.

Discussion and Conclusion

The inspectors concluded that the original vendor test had not completely demonstrated compliance to RG 1.9, but that Calculation E4C-082 demonstrated that there was no safety significance in the differences. The inspectors concluded that the calculation, vendor tests, and TS tests demonstrated compliance with RG 1.9 for acceptable dynamic response of the EDGs to accident loads. This item is closed.

c. (Closed) Unresolved Item 50-361, 50-362/88-10-11: Potential Electrical Distribution System High Voltage

Original NRC Open Item

The inspectors determined that the licensee's voltage regulation calculation had an error concerning transformer tap settings. Based on a review of this calculation and assuming unloaded conditions the inspectors were concerned that voltage values may exceed motor ratings. The licensee did not have a calculation which completely provided a design basis voltage regulation study at the time of the inspection.

Licensee's Actions in Response to the Open Item

The licensee performed Calculation E4C-090, discussed in Section 4.a of this report.

Inspectors' Actions During the Present Inspection

The inspectors reviewed Calculation E4C-090. See Section 4.a for details.

Discussion and Conclusion

Calculation E4C-090 indicated that the potential existed for voltages to exceed equipment ratings. However, since the licensee's response to this item and unresolved item 88-10-03 both involve resolution of Calculation E4C-090 results, further review of this specific concern will be included in future NRC staff review of potential high voltage concerns of unresolved item 88-10-03. This item is closed.

d. (Closed) Followup Item 50-361, 50-362/88-22-07: Emergency Diesel Generator Reliability for Fire Protection Analysis

Original NRC Open Item

An inspector noted that the licensee was performing an evaluation of safe shutdown and non-safe shutdown loads. The inspector left NRC staff review of this evaluation as a followup item. This item was reviewed later in Inspection Reports 89-29 and 90-16. Inspection Report 90-16 determined that the licensee deliberately removed power from both alternating current emergency busses and concluded that this action was adequate with the following two concerns:

1. Since only EDG A was credited for safe shutdown, EDG A operability history should be reviewed to determine reliability.

2. An alternate source of power besides EDG A should be considered.

Licensee's Actions in Response to the Open Item

The licensee reviewed the inspectors' concerns and noted that EDG A had started 13 times out of the last 13 demands. The licensee also noted that EDG reliability was being continuously monitored.

The licensee noted that an alternate power source was not required by 10 CFR Part 50 Appendix R, Section III.L.6 and that their safe shutdown plans had been approved by the NRC staff in a Safety Evaluation Report, dated June 29, 1988.

The licensee also noted that although safe shutdown equipment reliability was not directly considered as part of Appendix R analysis, they plan to perform a fire protection PRA consistent with Generic Letter 88-20, Supplement 4, "Individual Plant Examination of External Events (IPEEE) for Severe Accident Vulnerabilities - 10 CFR 50.54 (f)." The licensee considered that this analysis would examine safe shutdown equipment reliability to determine where shutdown vulnerabilities exist.

Inspectors' Actions During the Present Inspection

The inspectors reviewed the licensee's evaluations.

Discussion and Conclusion

The inspectors determined that the licensee was performing adequate monitoring of EDG A to keep reliability high. The inspectors concluded that the licensee was not required to consider alternate power sources for safe shutdown.

Based on the licensee's commitment to review fire protection equipment reliability as part of their response to GL 88-20, the inspectors considered this item adequately resolved. This item is closed.

e. (Closed) Unresolved Item 50-361/89-11-03: Excore Neutron Monitors Not Documented as Post Accident Monitoring Instrumentation

Original NRC Open Item

A 1989 inspection identified that the excore neutron monitors were not listed in Table 3.11.5 and Table 7.5-2 of the Updated Final Safety Analysis Report (UFSAR) and not labeled on the main control panel as post accident monitoring instrumentation (PAMI). The control room operators were not aware that the excore neutron monitors were PAMI.

Licensee's Actions in Response to the Open Item

The licensee had just recently prepared an FSAR revision to correct the problem and indicated that the delay in the FSAR change was due

to the transfer of the database from the SONGS Commitment Register (SOCR) to the Regulatory Commitment Tracking System (RCTS) and the late completion of the PAMI review by design engineering. The licensee completed the PAMI review and established a centralized PAMI document, "Songs Units 2 and 3 Regulatory Guide 1.97 Instrumentation Report #90065," Revision 0, Quality Class II, dated October 16, 1992.

Design Engineering informed Operations by means of a memorandum, on May 12, 1992, that the excore neutron monitors were credited as PAMI and should be treated as such.

The licensee indicated the update to the two UFSAR tables in question will be included in revision 9, which was scheduled for submittal in February 1993. The licensee informed the inspector that the instruments will be labeled accordingly on the main control board during the next refueling outage.

Inspector's Actions During the Present Inspection

The inspector reviewed the design change package (DCP) 6160.0J, "Install New Excore Startup Channel Equipment Located Inside Containment," Revision 1, to confirm that the equipment was purchased and installed per PAMI requirements.

The inspector reviewed the licensee's schedule of correcting the document deficiency, a copy of revision 9 of the UFSAR, and the design engineering memorandum to operations.

Discussion and Conclusion

The inspector concluded that the licensee's corrective action appeared to be adequate but also appeared to have taken an extraordinary length of time. This item is closed.

f. (Closed) Unresolved Item 50-361, 50-362/89-16-11: Inadequate Station Blackout Emergency Lighting

Original NRC Open Item

The inspector noted that emergency lighting did not appear to be adequate to support safe shutdown during station blackout (SBO). The item was left unresolved pending approval of the licensee's SBO plan in accordance with 10 CFR 50.63.

Licensee's Actions in Response to the Open Item

The licensee reviewed their emergency lighting and concluded that additional lighting was required for SBO. The licensee issued design change package (DCP) 2/3-6711.00SE, Revision 0, "Station Blackout," and minor modification package (MMP) 2/3-6888.00SE,

Revision 0, "Unit 2/3 Control Room Essential Lighting Modification," to upgrade the emergency lighting for SBO.

Inspectors' Actions During the Present Inspection

The inspectors reviewed DCP 2/3-6711.00SE and MMP 2/3-6888.00SE and discussed these changes with the licensee.

Discussion and Conclusion

The licensee committed to install the emergency lighting per DCP 2/3-6711.00SE and MMP 2/3-6888.00SE to support SBO compliance. The inspectors noted that the NRC staff had already approved the licensee's SBO plan for Units 2/3. The inspectors considered that DCP 2/3-6711.00SE and MMP 2/3-6888.00SE were technically adequate, however, the inspectors did not attempt to validate the adequacy of all emergency SBO lighting.

Based on an approved SBO plan for Units 2/3 and the technical review of the licensee's instructions for upgrade of SBO emergency lighting, the inspectors concluded that this item was adequately resolved. This item is closed. The inspectors noted that NRC staff review of SBO compliance may be accomplished in a future inspection.

g. (Closed) Followup Item 50-361, 50-362/89-200-03: Inadequate Voltage to 120 Volt Alternating Current Loads

Original NRC Open Item

The inspectors determined that licensee calculations, which calculated the minimum voltage to motor contactors, were non-conservative. When conservative numbers and assumptions were used the worst case voltage to certain 120 volt alternating current (ac) motor contactors would fall below the contactors' design minimum operating voltage of 102 volts ac.

Licensee's Actions in Response to the Open Item

The licensee immediately tested a sample of 120 volt ac contactors which were calculated to have worst case voltages below 102 volts ac. These contactors operated below their calculated worst case minimum voltage. Based on satisfactory operation of this sample, the licensee then routinely tested the remainder of the 120 volt ac motor contactors, which had calculated worst case voltages below the design rating of a minimum of 102 volts ac. The licensee completed these tests and concluded that the calculated worst case minimum voltages were adequate to operate all 120 volt ac motor contactors.

Inspectors' Actions During the Present Inspection

The inspectors reviewed the licensee's conclusions, the test methodology and the test results.

Discussion and Conclusion

The inspectors noted that the test procedures recorded the minimum voltage that each contactor would energize and the minimum voltage that each contactor would drop out. The inspectors reviewed the test results and determined that all the motor contactors operated satisfactorily below their calculated worst case voltages. The inspectors concluded that the testing adequately demonstrated that the 120 volt ac motor contactors would operate satisfactorily under calculated worst case low voltage conditions. This item is closed.

h. (Closed) Followup Item 50-361, 50-362/89-200-04: Inadequate Class 1E Battery Room Temperature Control

Original NRC Open Item

The inspectors noted that the design basis minimum battery electrolyte temperature was 60 degrees Fahrenheit (F) and the design basis minimum outside air temperature was 36 degrees F. The inspectors determined that the battery rooms had a non-Class 1E heater in lieu of a dependable Class 1E heater. The inspectors considered that in the event of failure of the non-Class 1E heater, there was no method to ensure that the battery electrolyte would be maintained above 60 degrees F. The inspectors noted that battery electrolyte temperatures below 60 degrees F could result in decreased battery capacity.

Licensee's Actions in Response to the Open Item

The licensee calculated that the worst case battery room temperature would be 42 degrees F. At the time of the inspection, the licensee calculated that the batteries had sufficient capacity at 42 degrees F. The licensee noted that station operating procedures required an operator to monitor battery room exhaust temperatures once a shift and to take appropriate corrective action if temperatures were below 60 degrees F.

As permanent corrective action, the licensee installed high and low temperature alarms in the battery rooms. The alarms were annunciated in the control room.

Inspectors' Actions During the Present Inspection

The inspectors reviewed the installation procedure for the new alarm circuit, the circuit design, and the alarm response procedure. The inspectors also visually inspected the installations.

Discussion and Conclusion

The inspectors determined that the battery room temperature alarm had been added to an existing switchgear room alarm. However, the inspectors also determined that the design allowed operators to locate an alarm source and temporarily disable any false alarms which could mask real alarms. The inspectors determined that the alarm response procedure provided adequate guidance to allow the operators to maintain satisfactory battery room temperatures. The inspectors determined that the equipment was installed in accordance with procedure requirements. The temperature detectors were mounted in an appropriate position to represent battery temperatures and were set to alarm before high/low temperature limits were reached. The inspectors concluded that the battery room temperature alarms and alarm response procedure were adequate to ensure proper battery electrolyte temperatures. This item is closed.

i. (Closed) Followup Item 50-361, 50-362/89-200-10: Incorrect Emergency Diesel Generator Load Calculation/Unresolved Fuel Requirements

Original NRC Open Item

The inspectors determined that the emergency diesel generator (EDG) load calculation was not conservative and did not match the latest loads listed in the Updated Final Safety Analysis Report (UFSAR), Table 8.3-1.

The inspectors noted that an updated EDG load calculation would affect calculations pertaining to fuel oil day tank and fuel oil storage tank minimum required storage volumes. The inspectors also determined that the licensee's calculation for fuel oil storage tank minimum volume was inconsistent with Section 9.5.4.1 of the UFSAR. Section 9.5.4.1 stated that the minimum fuel volume was calculated to provide seven days of fuel using calculational methods specified in American National Standards Institute (ANSI) Standard N195.

The inspectors determined that the licensee calculation which determined the minimum fuel oil required for seven days did not meet ANSI N195 because it did not contain the 10 percent margin required by the standard.

The inspectors provided the concerns with the EDG loading and minimum fuel oil storage calculations to the licensee during the inspection and documented those concerns in Inspection Report 50-361, 50-362/89-200 dated January 12, 1990.

Licensee's Actions in Response to the Open Item

The licensee reviewed the actual fuel on hand and determined that

sufficient margin existed to ensure adequate fuel for 7 days, pending new calculations.

The licensee issued a new EDG loading calculation, Number E4C-088, Revision 0, "Emergency Diesel Generator Loading," on June 18, 1991. The licensee issued a revised minimum fuel oil storage calculation, Number M-0016-008, Supplement A, Revision 0, "DG Onsite Fuel Oil Requirements," on June 18, 1991.

Inspectors' Actions During the Present Inspection

The inspectors reviewed Calculations E4C-088 and M-0016-008 and compared these calculations to the UFSAR and Technical Specification requirements.

Discussion and Conclusion

Calculation E4C-088 indicated adequate EDG capacity. The inspectors reviewed UFSAR Table 8.3-1 and determined that the table and Calculation E4C-088 now matched. The inspectors reviewed sample inputs for Calculation E4C-088 and determined that they were conservative.

The inspectors reviewed Calculation M-0016-008 and determined that it had not incorporated the 10 percent margin required by ANSI N195, as previously documented in Inspection Report 50-361, 50-262/89-200, dated January 12, 1990. The 10 percent margin required approximately 2500 more gallons of fuel oil to meet the fuel oil minimum requirement.

Independent of the inspectors' review, the licensee also noted the error in Calculation M-0016-008. The licensee issued Nonconformance Report 9301001900 on January 12, 1993, documenting the error. The licensee issued a revised fuel oil storage calculation on January 25, 1993. Due to conservatism in their fuel storage, the licensee concluded that they currently had sufficient fuel oil in the tanks to meet the new calculation requirements.

The inspectors concluded that Calculation E4C-088 was adequate to resolve the loading issues reported in open item 50-361, 50-362/89-200-10. The inspectors also concluded that failure to incorporate the 10 percent margin required in ANSI N195 in Calculation M-0016-008, Supplement A, dated June 18, 1991, as committed in UFSAR Section 9.5.4.1, and noted in Inspection Report 50-361, 50-362/89-200, violated 10 CFR 50 Appendix "B" Criterion XVI in that the licensee corrective action was not timely. Followup item 50-361, 50-362/89-200-10 was closed and upgraded to a violation. (Violation 50-361, 50-362/93-01-01)

j. (Closed) Followup Item 50-361, 50-362/89-200-11: Inadequate Overpressure Protection for Emergency Diesel Generator Cooling Water Expansion Tank"

Original NRC Open Item

The inspectors noted that the EDG jacket cooling water expansion tank was an ASME Section III tank. However, the tank was fitted with a non-ASME code filler cap, which also served as over-pressure protection for the tank. This design was provided as part of the original vendor design.

Licensee's Actions in Response to the Open Item

The licensee installed a temporary modification which included a tested relief valve. The licensee then performed a design modification which added an ASME Section III relief valve and associated piping to each expansion tank.

Inspectors' Actions During the Present Inspection

The inspectors reviewed the design change instructions, the material assembly records, the shop test records, documentation of ASME program changes to include the new valves, and the installation tests. The inspectors also visually inspected the installations.

Discussion and Conclusion

The inspectors considered that the records and actual installations were adequate. This item is closed.

k. (Closed) Followup Item 50-361, 50-362/89-200-14: Diesel Generator Fuel Oil Day Tank Level Calibration

Original NRC Open Item

In the 1989 electrical distribution system functional inspection, the inspectors identified that the calibration procedure for the diesel fuel oil day tank level instrumentation was inadequate. The inspectors also determined that design documents were inconsistent.

Licensee's Actions in Response to the Open Item

The licensee revised calibration procedure SO123-II-9.245, "GEMS 36000 and 51000 Series TLI System Modular Receiver Transmitter and Indicator Calibration," to ensure that the diesel fuel oil day tank level transmitters would be subjected to a five-point calibration check.

The licensee revised the setpoint calculations and issued Calculation J-JEA-001, "Fuel Oil Level Set Points for Diesel

Generator Day Tank," to document the new setpoints. The licensee also updated the following documents to ensure consistency on instrument tag numbers, setpoints, ranges, and signal paths:

1. Alarm response procedure SO23-5-2.35.1, "Diesel Generator G-002 Local Annunciator Panel 0160 Alarm Response,"

2. Instrument calibration data cards for the day tank level instruments.

3. SONGS 2/3 Plant Setpoint List, Revision 26.

4. System Description SD-SO23-750.

5. Drawing 40110B, "Piping and Instrument Diagram, Diesel Generator System."

6. Drawing 30345, Sheet 1, "Elementary Diagram Diesel Generator 2G002 Accessories,"

Inspector's Actions During the Present Inspection

The inspector reviewed the revised documents and verified the consistency.

In the 1989 inspection, the inspectors identified that a superseded Drawing SO23-403-12-74 was referenced in multiple documents. The inspector verified that the superseded Drawing SO23-403-12-74 was traceable through the licensee's on-line document control system. The superseding drawing was readily identifiable. The licensee claimed that the superseded drawing did not need to be deleted from existing drawings.

The inspector also reviewed the Operator Aid Document 3-034, "Final Tank Level Limits," and found the data on the document conservative.

Discussion and Conclusion

As a result of the 1989 inspection, the licensee implemented a minor modification package (MMP) 2-6795.00SM, "Diesel Generator Fuel Oil Day Tank Level Settings," Revision 0, to resolve the conflicting setpoint information in system descriptions, procedures, and design documents. The inspector identified changes on page 126 of System Description SD-SO23-750 as directed by the MMP was not implemented. This indicated a weakness in the licensee's design change control process in verifying the completion of the intended work of a design change.

After the review of documents, the inspector concluded that the calibration procedure for the diesel fuel oil day tank level instrumentation was adequate. The licensee has adequately

established consistency in the design documents. This item is closed.

l. (Closed) Followup Item 50-206, 50-361, 50-362/IN-89-19: Repair and Use of the Health Physics Network

Original NRC Open Item

Information Notice 89-19, "Health Physics Network," provided guidance on repair and use of the Health Physics Network. This item was left for NRC followup review of licensee actions.

Licensee's Actions in Response to the Open Item

The licensee modified their instructions for use and repair of the Health Physics Network (HPN) to be consistent with the guidance of IN 89-19.

Inspectors' Actions During the Present Inspection

The inspectors reviewed the licensee's actions and discussed the HPN with licensee personnel.

Discussion and Conclusion

The inspectors noted that the IN 89-19 guidance for repair of the HPN was changed by the NRC and no longer applied. The inspectors determined that the licensee was following the latest guidelines for repair and use of the HPN. This item is closed.

m. (Closed) Followup item 50-206/IN-89-79: Degraded Steel Containments

Original NRC Open Item

The NRC issued Information Notice 89-79, "Degraded Coatings and Corrosion of Steel Containment Vessels," to alert licensees of the potential for unexpected damage to stainless steel containments. The corrosion was mainly due to moisture buildup at the bottom of the containments that were inaccessible for routine inspections. This IN was left as a followup item for Unit 1. Units 2/3 did not have this type of containment.

Licensee's Actions in Response to the Open Item

The licensee evaluated IN 89-79 and concluded that the design of Unit 1 minimized the potential for the type of problems noted in IN 89-79 because of the greater accessibility of the Unit 1 containment for inspection and the presence of a skirt around the containment which minimized the potential for moisture buildup at the bottom.

Inspectors' Actions During the Present Inspection

The inspector reviewed the licensee's evaluation.

Discussion and Conclusion

The inspectors concluded that the licensee's evaluation that the Unit 1 design minimized the type of problems noted in IN 89-79 was adequate. This item is closed.

n. (Open) Followup Item 50-361, 50-362/91-01-09: Instrument Uncertainty Calculations

Original NRC Open Item

The inspectors noted errors and omissions in the licensee's calculations for instrument uncertainties during design bases accidents. Inspection Report 92-23 followed up on this item and determined that the licensee had completed several associated calculations and determined that several abnormal operating procedure changes were warranted. However, the licensee had not completed a number of associated calculations.

Licensee's Actions in Response to the Open Item

The licensee was continuing work on the uncertainty calculations.

Inspectors' Actions During the Present Inspection

The licensee presented the inspectors with an updated status of their setpoint calculations program. The inspectors reviewed completed uncertainty calculations, including Calculations J-BBB-004, Revision 0, "TLU [Total Loop Uncertainty] for RCS Hot Leg Temperature Indicator 2(3)TI-0111BX," and J-BBB-001, Revision 0, "TLU for RCS Cold Leg Temperature Indicator 2(3)TI-0111BY."

Discussion and Conclusion

The inspectors considered the calculations reviewed had adequate technical methodology to support their conclusions.

As of January 11, 1993, the licensee stated that they had completed 48 of 103 setpoint uncertainty calculations, with an additional 24 calculations undergoing internal review. The inspectors concluded that the licensee was making adequate progress on resolution of this item.

The inspectors determined that the licensee presently did not include site specific adverse condition instrument uncertainty values in their emergency operating instructions (EOIs). Instead, the licensee was using instrument uncertainty criteria based on generic Combustion Engineering values. The licensee stated that

they did not have specific methodology for determination that the generic CE values were applicable to Units 2/3. The licensee also stated that they had contracted with Combustion Engineering to develop "engineering limits" for Units 2/3 EOIs and they had initiated a Combustion Engineering Owners Group task to develop a plan to address instrument uncertainties in emergency operating procedures.

This item will remain open pending licensee completion of instrument uncertainty calculations associated with EOIs and review of the licensee's methodology for incorporating the calculated instrument uncertainties into EOIs.

o. (Closed) Followup Items 50-206/91-07-01, 02, 03, 04, 05, 06, and 07: Deficiencies in Implementation of Regulatory Guide 1.97, "Instrumentation for Light-Water-Cooled Nuclear Power Plants to Assess Plant and Environs Conditions During and Following an Accident"

Original NRC Open Item

The inspectors found seven areas where the Unit 1 instrumentation did not appear to meet or be equivalent to Regulatory Guide (RG) 1.97 guidance for post accident instrumentation.

Licensee's Actions in Response to the Open Item

Independent of these findings, the licensee decided to permanently shutdown Unit 1.

Inspectors' Actions During the Present Inspection

The inspector reviewed these seven items.

Discussion and Conclusion

The inspectors concluded that all seven items were technical issues with Unit 1 only and did not involve any broad based issues which would affect Units 2 and 3. The inspectors also concluded that the seven items had no affect on defueling and spent fuel pool operations in Unit 1. These items are closed.

p. (Closed) Followup Item 50-206, 50-361, 50-362/91-15-02: Evaluation of Emergency Diesel Generator Information Notices

Original NRC Open Item

The inspector determined that the licensee had not evaluated two Information Notices (INs) concerning operation of emergency diesel generators (EDGs) at the time of the inspection. These were IN 91-06, "Lock-up of Emergence Diesel Generator and Load Sequencer Control Circuits Preventing Restart of Tripped Emergency Diesel

Generator," dated January 31, 1991 and IN 91-34, "Potential Problems in Identifying Causes of Emergency Diesel Generator Malfunctions," dated June 3, 1991.

Licensee's Actions in Response to the Open Item

On May 29, 1991, the licensee determined that the Units 1/2/3 EDGs would require a detailed engineering analysis to determine if the problems discussed in IN 91-06 warranted any actions. On November 23, 1992, engineering completed a detailed analysis between the design of the Unit 2/3 EDG systems and the systems discussed in IN 91-06. The licensee concluded that the problems noted in IN 91-06 were not possible at Unit 2/3 due to differences in circuit design. Based on the delay in accomplishing the engineering review, the licensee informed the inspectors that they decided that review of Unit 1 was not warranted due to the permanent shutdown.

On June 26, 1992, the licensee determined that implementation of additional EDG monitoring equipment described in IN 91-34 would not be cost effective.

Inspectors' Actions During the Present Inspection

The inspectors reviewed the licensee's evaluations of IN 91-06, and IN 91-34. The licensee stated that review of INs was covered by Quality Assurance Procedure (QAP) N2.24, "Independent Safety Engineering Group Functions." The inspectors also reviewed and discussed QAP N2.24 with the licensee.

Discussion and Conclusion

The licensee complied with QAP N2.24 requirements for the evaluation of the subject INs. The licensee's technical evaluation of IN 91-06 was very detailed and was adequate. This item is closed.

q. (Closed) Followup Item 50-361, 50-362/92-11-01: End-to-End Testing of Diverse Emergency Feedwater Actuation System

Original NRC Open Item

At the time of the post installation inspection of the Anticipated Transients Without Scram (ATWS) systems, the licensee had not completed the refueling end-to-end test procedure for the Diverse Emergency Feedwater Actuation System. The inspectors were to verify the implementation of this test procedure.

Licensee's Actions in Response to the Open Item

The licensee issued test procedure SO23-II-1.116, "Diverse Emergency Feedwater Actuation System (DEFAS) Channel Calibration and Trip Logic Test," Revision 0, dated September 11, 1992.

Inspector's Actions During the Present Inspection

The inspector reviewed the test procedure. The test procedure verified the operation of the system from the sensor output to the final trip relay actuation for all four channels.

Discussion and Conclusion

The inspector concluded that the test procedure adequately verified the operation of DEFAS. This item is closed.

r. (Closed) Followup Item 50-361, 50-362/92-11-02: Quality Classification of the Motor-Generator Set Output Contactors of the Diverse Scram System

Original NRC Open Item

During the ATWS inspection, the inspectors identified that the motor-generator set output contactors of the diverse scram system, which were used to interrupt power to the control rods, were not classified as quality classification (QC) III/ATWS by the licensee.

Licensee's Actions in Response to the Open Item

In August 1992, the licensee initiated design change notices 4407 and 4408 to Unit 2 drawing SO23-908-41 and Unit 3 drawing SO23-908-50, "Elementary Connection Diagram, M-G Package Set," respectively, to reclassify the existing motor-generator set output contactors to QC III/ATWS. The licensee indicated in the procurement engineering package that the contactors installed during the original construction of the plant were operationally tested and accepted during the initial start-up and subsequently tested to approved maintenance procedures during unit outages. Procurement of replacement contactors will be subject to the quality requirements of the Topical Quality Assurance Manual Chapter 8-B. The Plant Equipment Data Management System identified the quality class of the contactors. This ensured that any work on the contactors would be in accordance with the specified quality classification. The upgraded status assured that nonconforming conditions will be tracked by the station nonconformance reporting system.

Inspector's Actions During the Present Inspection

The inspector reviewed the procurement engineering package, Chapter 8-B of the Topical Quality Assurance Manual, a printout of the Plant Equipment Data Management System, and the nonconforming control process related to the upgraded contactors.

Discussion and Conclusion

The documents prepared and submitted to the inspector for review adequately showed compliance with Generic Letter 85-06, "Quality

Assurance Guidance for ATWS Equipment That Is Not Safety-Related." This item is closed.

s. (Closed) Followup Item 50-362/92-20-04: Control of Single Cell Charging of Class 1E Batteries using Non-Class 1E Battery Chargers

Original NRC Open Item

The inspector noted that the licensee was using a non-Class 1E battery charger to charge a single Class 1E battery cell without seismic or technical controls. The inspector also determined that the licensee's procedure contained technical discrepancies.

Licensee's Actions in Response to the Open Item

The licensee performed a 10 CFR 50.59 evaluation on use of a non-Class 1E battery charger to charge a single Class 1E battery cell. The licensee updated Procedure SO123-I-9.301, Revision 1, "Spare and Single Battery Cell Inspections and Testing."

Inspectors' Actions During the Present Inspection

The inspectors reviewed the 10 CFR 50.59 evaluation, reviewed Procedure SO123-I-9.301, reviewed data history for charging of single Class 1E battery cells, and visually inspected the chargers.

Discussion and Conclusion

The inspectors determined that Revision 1 of Procedure SO123-I-9.301 had corrected the technical discrepancies and resolved the original concern except for control of multiple recharging of a single cell. The inspectors were concerned that impending failure of a cell could be masked by continual recharging. The inspectors determined that two cells, which had been single cell charged twice in 1989, had subsequently required replacement. The inspectors reviewed the issue of multiple recharging of a single cell with the licensee. The licensee stated that they would change Procedure SO123-I-9.301 to require engineering notification prior to single cell charging.

The inspectors reviewed engineering involvement in routine battery maintenance. The assigned system engineer had a listing of all recent single cell charges, and appeared to be cognizant of the licensee's routine monitoring of battery conditions.

The inspectors concluded that the licensee's completed actions and committed action to change Procedure SO123-I-9.301 to ensure engineering involvement in single cell charging was adequate to resolve this item. This item is closed.

t. (Open) Other Followup Items

The licensee listed the following open items as completed, but review of these items was not completed during this inspection. The staff will review these items during future inspections.

Open Item 50-361, 50-362/85-22-03 (IST for Pumps)
Open Item 50-361, 50-362/92-02-01 (MOV Low Voltage Calculation)
Open Item 50-361, 50-362/92-02-02 (MOV Calculation Errors)
Open Item 50-361, 50-362/88-10-09 (Service Water Flow)

The inspectors requested information on the following items and noted that the licensee's actions were not complete. The staff will review these items during future inspections.

Open Item 50-361, 50-362/88-10-08 (CCW/SW Heat Capacity)
Open Item 50-361, 50-362/91-01-04 (Tank Level Calculations)
Open Item 50-361, 50-362/92-02-03 (MOV Issues)
Open Item 50-361, 50-362/88-10-02 (Failure Analysis)

One violation was identified in the areas inspected.

5. Previously Identified Enforcement Items (92702)

a. (Closed) Enforcement Item 50-361, 50-362/89-200-09: Inadequate Air Pressure for Five Cranking Cycles of the Diesel Generators

Original NRC Open Item

In the 1989 electrical distribution system functional inspection, the inspectors identified that the emergency diesel generator air system compressor start setpoint (182 psig) and air receiver low pressure alarm setpoint (165 psig) were not sufficient to ensure five cranking cycles of the diesel generators as described in paragraph 9.5.6.2.1.3 of the Units 2/3 Final Safety Analysis Report. Both setpoints were below the 195 psig established during preoperational testing as the minimum pressure to ensure five cranking cycles.

Licensee's Actions in Response to the Open Item

In response to the Notice of Violation the licensee committed to implement a design change package, as described in Section 2 of this report, to add additional air start capacity and to replace the existing four compressors with four of higher capacity. The licensee completed this modification.

Inspector's Actions During the Present Inspection

As previously described in Section 2 of this report, the inspector verified the total capacity of the new and existing receivers was capable of cranking a diesel engine five times, starting at a

receiver pressure of 170 psig or less, without recharging the receiver. Each cranking cycle duration was observed by the licensee during the post modification testing to be approximately three seconds and two or three engine revolutions. Each compressor was able to completely recharge its air receivers from 120 psig (minimum cranking pressure) to 185 psig within 30 minutes. The compressor started and stopped at receiver pressure of 185 and 200 psig, respectively.

Discussion and Conclusion

The inspector concluded that the licensee has taken adequate corrective actions in meeting the air capacity design requirement of five starts. This item is closed.

b. (Closed) Enforcement Item Number 50-361, 50-362/91-01-01: Failure to Ensure That Surveillance Procedures Accurately Reflected Design Assumptions

Original NRC Open Item

The NRC Region V Instrumentation and Control (I&C) Setpoint team found that assumptions used in calculations to determine instrument setpoints were not reflected in the licensee's surveillance and maintenance procedures. For example, calculations for feedwater flow uncertainties assumed that measuring and test equipment (M&TE) was 4 times as accurate as the feedflow transmitters. However, the feedwater maintenance procedure only required that the M&TE be as accurate as the feedflow transmitter.

Outside engineering organizations, for the most part, accomplished the calculations which included assumptions not consistent with the licensee's surveillance and maintenance procedures. The I&C team questioned the effectiveness of the licensee's review process for contractor performed calculations.

Licensee's Actions in Response to the Open Item

In response to the Notice of Violation, the licensee committed to correct the calculations with assumptions not reflected in maintenance and surveillance procedures. The licensee modified Nuclear Engineering, Safety and Licensing Department Procedures 23-1-1, Revision 1, PCN 1, "Document Review Control," and 37-8-26, Revision 9, PCN 2, "Processing of Supplier Documents." These modifications specified the engineering organization responsible for reviewing contractor calculations, and provided guidance on the extent of the review required.

Inspectors' Actions During the Present Inspection

The inspectors reviewed samples of revised contractor calculations and compared them to licensee maintenance and surveillance

procedures. The inspectors reviewed the licensee's administrative control procedures for contractor calculations.

Discussion and Conclusion

The inspectors did not note any differences between setpoint calculation assumptions and maintenance and surveillance procedure requirements.

The inspectors considered that the administrative procedures provided adequate guidance for review of contractor calculations. This item is closed.

c. (Closed) Enforcement Item 50-361, 50-362/91-01-03: Incorrect Steam Generator Low Water Level Trip

Original NRC Open Item

The NRC Region V I&C Setpoint team found that the licensee had incorrectly calculated the calibration range of the transmitters for the steam generator low water level trip. This error caused the trip to be set outside the Technical Specification (TS) limit.

Licensee's Actions in Response to the Open Item

The licensee immediately raised the low level trip point to comply with the TS limit.

In response to the Notice of Violation the licensee committed to recalculate the calibration range of the transmitters for the steam generator low water level trip. The licensee completed this calculation and recalibrated the transmitters to the new calculated values. In addition, the licensee was reviewing other similar safety related level indication calculations for similar errors in response to this violation and Inspector Followup Item 50-361, 50-362/91-01-04. These reviews were scheduled to be complete by April 12, 1993.

Inspectors' Actions During the Present Inspection

The inspectors reviewed the calculation and the associated surveillance procedures for the steam generator low water level trip.

Discussion and Conclusion

The inspectors concluded that the calculation was adequate and was correctly reflected in the licensee's surveillance procedures. This item is closed. The more generic licensee review of other calculations for similar errors will be followed-up, upon completion of licensee action, during future inspections of Inspector Followup Item 50-361, 50-362/91-01-04.

No violations or deviations from NRC requirements were identified in the areas inspected.

6. Exit Meeting

The inspectors conducted an exit meeting on January 29, 1993, with members of the licensee staff as indicated in Section 1. During this meeting, the inspectors summarized the scope of the inspection activities and reviewed the inspection findings as described in this report. The licensee acknowledged the concerns identified in the report. The licensee did not identify as proprietary any of the materials provided to the inspectors.