U.S. NUCLEAR REGULATORY COMMISSION

REGION V

Report Nos. 50-206/92-23, 50-361/92-23, 50-362/92-23

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

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

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

Facility Name: San Onofre Nuclear Generating Station
Units 1, 2 and 3

Inspection at: San Onofre, San Clemente, California

Inspection conducted: July 17, 1992 through August 26, 1992

Inspectors: C. W. Caldwell, Senior Resident Inspector
D. L. Solorio, Resident Inspector
C. D. Townsend, Resident Inspector

Accompanying Inspector: M. Fields, Project Manager

Approved By: ______________________ 9/29/92
H. J. Wong, Chief Date Signed
Reactor Projects Section 2

Inspection Summary

Inspection on July 17 through August 26, 1992 (Report Nos. 50-206/92-23, 50-361/92-23, 50-362/92-23)

Areas Inspected: Routine resident inspection of Units 1, 2 and 3 Operations Program including the following areas: operational safety verification, radiological protection, security, evaluation of plant trips and events, engineered safety feature walkdown, plant modifications, licensee self assessment, calibration, electrical maintenance, falsification of plant records, monthly surveillance activities, monthly maintenance activities, independent inspection, licensee event report review, followup of previously identified items, and a meeting held in Region V. Inspection procedures 37700, 37701, 37828, 40500, 56700, 60710, 61726, 62703, 62705, 71707, 71710, 90712, 92700, 92701, 93702, TI 2515/115 were covered.

Safety Issues Management System (SIMS) Items: None

Results:

General Conclusions and Specific Findings:

Strengths

During simulator observations, the inspectors noted that there were weaknesses in command and control, and communications during scenarios involving the emergency operating instructions. The inspector noted that licensee management had also identified these weaknesses and was actively involved in enhancing operator performance in these areas (Paragraph 3.b).

The inspector reviewed the licensee's temporary facility modification (TFM) to the Unit 2 containment purge system. This TFM was implemented due to leakage across the outboard mini-purge valve. In general, the TFM appeared to be well designed and implemented (Paragraph 7).

A number of strengths were noted in the licensee's self-assessment program. The 10 CFR 50.59 safety evaluation program appeared to be effective in assessing plant changes and deficiencies (Paragraph 13.a). The licensee's Nuclear Oversight Division (NOD) performed a number of audits that were critical of licensee performance and that provided recommendations that were insightful. One example, concerning operator performance issues during a recent Unit 3 refueling outage, was considered valuable in focusing on enhanced performance (Paragraph 13.b). In addition, a stop work order was issued for welding operations as a result of a NOD surveillance that identified program weaknesses in the control of weld filler material (Paragraph 13.c).

Weaknesses

The inspector noted that Maintenance and Station Technical personnel did not understand the significance of nitrogen leakage from the accumulators of Unit 1 valve HV852B. The inspector also noted that there was no formal program to check the sub-components of the accumulators. With the absence of knowledge as to the impact of nitrogen leakage and the lack of a surveillance program to monitor accumulator piston location, HV852B was in a degraded condition when nitrogen leakage occurred over a three month period. On June 23, 1992, the valve was determined to have been inoperable based on the results of the significant piston misalignment identified on May 19, 1992 (Paragraph 15.e).

The licensee performed an evaluation of plant record keeping and found several examples where log entries were made for areas in which the plant operator did not enter. The licensee initiated a program to perform periodic surveillances to ensure that log readings are properly obtained (Paragraph 12).

The inspector reviewed the licensee's measuring and test equipment (M&TE) control program. The inspector found that the program was very difficult to audit. In addition, the inspector considered that the M&TE program was poorly defined and that proper implementation of the program relied heavily on the M&TE supervisor (Paragraph 11).

The NRC considered that, in general, the licensee correctly assessed plant problems and effected timely resolution. However, several weaknesses in timely and thorough assessment of plant problems or in effective communication of proposed corrective actions to the NRC were observed. In one instance, prompt visual assessment of pressurizer instrument line leakage in Unit 3 would have resolved questions that arose when unidentified leakage from the pressurizer vapor space was considered to be occurring. In another case, a detailed assessment of vital battery cracks in Unit 3 took more than a week (the NRC considered that the licensee's evaluation was still inconclusive). In addition, with regard to HV852B, the licensee was not correct in their technical assessment of the safety significance of the nitrogen leakage. Based on these examples, the NRC stressed the importance of timely and accurate assessment of emerging plant problems and encouraged continued licensee emphasis in this area and effective communications of these problems with the NRC (Paragraph 8).

Three examples of weaknesses in the interface between Station Technical and Operations personnel were observed in this report period. Examples involved performance of an in-service test in Unit 1 (Paragraph 4.b) and a thermographic test that resulted in a Unit 2 reactor trip (Paragraph 4.a). The third example involved a discrepancy between the simulator and the Units 2 and 3 control panel. A change made to the control panel in 1988 was not properly reflected in design documents or in the simulator due to a poor interface between Engineering and Operations that resulted in the design change being a backlog item for more than four years (Paragraph 10). A similar organizational weakness was also identified in NRC Inspection Report 50-206/92-20.

During plant tours, the inspector noted that operators were attaching non-qualified equipment on the Unit 1 safety injection piping without any evaluation. Further review indicated that there was no specific guidance for placing temporary non-qualified equipment on or near safety-related equipment (Paragraph 3.a).

Significant Safety Matters:

Summary of Violations:

One violation was identified during this inspection period which involved inadequate corrective actions for Unit 1 valve HV852B (Paragraph 15.e). A non-cited violation is identified in paragraph 14 and is related to the misalignment of a Unit 2 saltwater cooling pump emergency cooling water supply valve (LER 50-361/92-09).

Open Items Summary:

During this report period, 4 new followup items were opened and 5 were closed; 1 was examined and left open.

DETAILS

1. Persons Contacted

Southern California Edison Company

H. Ray, Senior Vice President, Nuclear
*H. Morgan, Vice President and Site Manager
*R. Krieger, Station Manager
*J. Reilly, Manager, Nuclear Engineering & Construction
B. Katz, Manager, Nuclear Oversight
*R. Rosenblum, Manager, Nuclear Regulatory Affairs
K. Slagle, Deputy Station Manager
*R. Waldo, Operations Manager
*L. Cash, Maintenance Manager
*M. Short, Manager, Station Technical
*M. Wharton, Manager, Nuclear Design Engineering
P. Knapp, Manager, Health Physics
W. Zintl, Manager, Emergency Preparedness
*D. Herbst, Manager, Quality Assurance
*C. Chiu, Manager, Quality Engineering
J. Schramm, Plant Superintendent, Unit 1
V. Fisher, Plant Superintendent, Units 2/3
*G. Hammond, Supervisor, Onsite Nuclear Licensing
*J. Reeder, Manager, Nuclear Training
H. Newton, Manager, Site Support Services
*R. Plappert, Manager, Technical Support and Compliance
*R. Borden, Supervisor, Quality Assurance
*J. Jamerson, Lead Engineer, Onsite Nuclear Licensing
*J. Travis, Maintenance Manager, Unit 1
*J. Fee, Assistant Manager, Health Physics
*M. Herschthal, Assistant Manager, Station Technical
*A. Thiel, Supervisor, Station Technical
*C. LaPorte, Supervisor, Maintenance
*M. Motamed, Nuclear Safety Group

San Diego Gas and Electric Company

*R. Erickson, Site Representative

City of Riverside

*C. Harris, Site Representative

*Denotes those attending the exit meeting on August 26, 1992.

The inspectors also contacted other licensee employees during the course of the inspection, including operations shift superintendents, control room supervisors, control room operators, QA and QC engineers, compliance engineers, maintenance craftsmen, and health physics engineers and technicians.

2. Plant Status

Unit 1

Unit 1 operated at power for the entire inspection period.

Unit 2

Unit 2 operated at power until an automatic trip occurred on July 31, 1992. The trip was due to a sensed undervoltage condition created when a potential transformer drawer was opened (Paragraph 4.a). The Unit restarted on August 2, 1992, and operated at power for the remainder of the inspection period.

Unit 3

Unit 3 operated at power for the entire inspection period.

3. Operational Safety Verification (71707)

The inspectors performed several plant tours and verified the operability of selected emergency systems, reviewed the tag out log and verified proper return to service of affected components. Particular attention was given to housekeeping, examination for potential fire hazards, fluid leaks, excessive vibration, and verification that maintenance requests had been initiated for equipment in need of maintenance. The inspectors also observed selected activities by licensee radiological protection and security personnel to confirm proper implementation of and conformance with facility policies and procedures in these areas.

a. Non-Qualified Components Tied To Safety-Related Equipment

During a plant tour on August 13, 1992, the inspector noted that operators were installing an airhorn (used for cooling) on safety-related equipment in Unit 1. In particular, the operators were tying the airhorn between a vertical run of safety injection piping and an associated snubber. The inspector discussed this with an on-shift senior reactor operator (SRO) who agreed that the action did not appear to be appropriate.

Discussions with the Unit 1 Operations Superintendent indicated that, historically, they have allowed operators to hook up cooling equipment (such as this) to safety-related components on a temporary basis. In addition, operators were free to make the judgment as to where to put the equipment. However, this has not been done per the work authorization process and as a result, installation of the equipment has not been evaluated in such cases.

The inspector considered that this condition did not appear to be safety significant since the weight of the airhorn was small in relation to the size of the piping and supports involved. However, the inspector was concerned since this could be construed as a modification to the system. As such, it should undergo the appropriate reviews. Further review revealed that there was no direct guidance in any procedure to control this activity. Procedure SO1-7-2, "Main Feedwater System," alluded to the potential dangers to equipment during a seismic event, but it did not give any specific guidance for temporary equipment being installed on or near safety-related equipment.

The inspector discussed this concern with the Unit 1 Operations Manager who indicated that he would revise documents to provide better guidance. The inspector will review the licensee's actions as part of the routine inspections.

b. Simulator Observations

The resident inspectors conducted a number of observations of Units 2 and 3 simulator activities for the period of May to July 1992. During those observations, the inspectors noted several weaknesses in crew performance. In particular, weaknesses in command and control, and communications were observed during simulator scenarios involving the emergency operating instructions (EOIs). The continuation of these types of difficulties was not expected by the inspector since some crews had been operating together for a long time; however, the inspector noted that none of the weaknesses resulted in improper implementation of the EOIs.

During the observations, the inspector noted that the licensee was effectively dealing with these communication and command/control weaknesses. The shift superintendent (SS) debriefed the crew after each scenario and the simulator instructors critiqued the SS's debriefing as well as the crew's performance. The inspector considered that these critiques were detailed and self-critical. In addition, they emphasized the need for better communications and team work. The licensee's critiques appeared to be valuable in working through the difficulties observed. The inspector also noted a considerable amount of management presence at the simulator.

The inspector concluded that, although there were weaknesses in the performance of several crews, the licensee appeared to be effectively dealing with them. The inspector encouraged the licensee's efforts and will continue to monitor the licensee's performance in this area as part of the routine inspection effort.

No violations or deviations were identified.

4. Evaluation of Plant Trips and Events (93702)

Automatic Trip Due To Opening Potential Transformer Drawer - Unit 2

On July 31, 1992, Unit 2 automatically tripped from 100% power after a loss of two of the four reactor coolant pumps (RCP's). The RCP's tripped on a sensed undervoltage condition when a potential transformer (PT) drawer was opened for thermographic inspections. The reactor trip was generated from the core protection calculators on a low departure from nucleate boiling ratio (DNBR) due to the low flow condition on the loss of two RCP's. In addition, the auxiliary feedwater system automatically started due to the decrease in steam generator level following the trip. Both of these automatic functions were expected and performed as designed for the conditions present.

The thermographic inspections were being performed by Station Technical (STEC) personnel as part of a routine surveillance in accordance with STEC procedure S0123-V-2.4, "Thermal Inspection Of Plant Components." The fact that the RCP's would trip and therefore cause a reactor trip was not commonly understood, and was not identified either in the procedure or by the personnel involved in the testing.

The licensee reported in Licensee Event Report (LER) 92-012 that the root cause was attributed to inadequate positive controls in the work package and an inadequate warning sign on the PT drawer. The licensee is taking corrective actions to develop positive controls in the work package and install improved signs. The inspector considered the licensee's corrective actions to be appropriate. However, this event appears to be another example in which a STEC program was not adequate to maintain proper configuration control in the plant. NRC Inspection Report 50-206/92-20 discussed two instances of a weak interface between STEC and Operations which led to configuration control problems. The licensee will address the concerns raised in Inspection Report 92-20 in their response to Notice of Violation from that report.

The inspector noted that Operations personnel had an opportunity for more effective communications with Station Engineering during a Unit 1 main feedwater pump inservice test (IST) in July 1992. In this case, the engineer was utilizing procedure S01-V-2.14.10, "Feedwater Inservice Pump Test," to perform the IST of the west feedwater pump, G3B. Earlier in the year (on January 2, 1992), an instrument drift problem occurred in conjunction with the same feedwater pump test (see NRC Inspection Report 92-06). In the January occurrence, the east feedwater pump discharge pressure gauge had drifted low. This resulted in the pump being inoperable (according to the IST program) until the gauge was recalibrated. In the July case, while it was not Operations responsibility to assure an accurate gauge was used for the test, Operations had the opportunity to alert Engineering of the past problem which resulted in unnecessarily declaring a piece of plant equipment inoperable.

No violations or deviations were identified.

5. Monthly Maintenance Activities (62703)

During this report period, the inspectors observed or conducted inspection of the following maintenance activities:

a. Observation of Routine Maintenance Activities (Unit 1)

92071359000	"'Y' Channel SIS Block LED Is Extinguished on Card 11 LED#3 'X' Channel Corresponding LED Is Illuminated."
90060431000	"Adjust/Rework N2 Regulators For Train 'B' SIS Valves As Required."

b. Observation of Maintenance Activities (Unit 3)

CWO 92090192	"Install a Temporary Battery Rack Adjacent to Battery Rack 3EB007 per Temporary Facility Modification (TFM)."

No violations or deviations were identified.

6. Engineered Safety Feature Walkdown (71710)

Unit 2

An evaluation of the safety alignments was performed on the Unit 2 Component Cooling Water (CCW) system with no significant findings. The following drawings and procedures were utilized: Piping and Instrument Drawings 40126, 40127, 50127, and Procedures SO23-2-17 and SD-SO23-400-1-3.

An evaluation was also performed of the Unit 2 Auxiliary Feedwater (AFW) System safety alignments with piping and instrument drawing 40160. No significant findings were identified.

No violations or deviations were identified.

7. Plant Modification and Refueling Activities (37700 and 37828)

Temporary Facility Modification On Unit 2 Mini-Purge Line

The inspector reviewed a temporary facility modification (TFM) to the Unit 2 containment purge system. The TFM was implemented because the outboard containment mini-purge valve leaked after the completion of containment venting on four occasions in June and July 1992. The leakage was determined to be due to buildup of small pieces of debris under the seat of mini-purge valve 2HV9825.

The scope of the design change was to install one-inch diameter tubing to the containment air sampling line outside of containment. The tubing was routed from radiation monitor 2RT7804 to the inlet ducting for normal containment mini-purge fan flow. The containment purge isolation (CPIS) contacts in the control circuits for mini-purge isolation valves 2HV9824 and HV9825 were moved to the containment atmosphere sample line isolation valves HV7800 and HV7801. Due to the reduced purge flow diameter (from eight inches to one inch), the time to complete a containment purge was substantially increased.

The inspector noted that a probabilistic risk assessment (PRA) is not required when performing a 10 CFR 50.59 review. However, the inspector questioned if the licensee had evaluated the potential impact of having this line open much longer than when using the eight inch mini-purge line (almost continuously versus four hours every 20 days). The licensee indicated that they had assessed the impact of having the purge line open continuously. However, as a result of the inspector's question, a limited PRA assessment was performed in which it was calculated that there was an insignificant increase in core damage or off-site release probability as a result of this TFM.

In general, the TFM appeared to be well designed, implemented and within program requirements. However, the inspector was concerned that there were no corrective actions other than to blow the debris away from the seat of HV9825 when the valve was found leaking. This had been done four times between June 9 and July 2, 1992. Thus, during that period, when the valve was opened, it could not perform its leak tight function. However, the inspector considered that this was of minor safety significance; the licensee assured that the valve was leak tight before they left it, leakage through the penetration was less than TS allowable, and the inboard valve appeared to be relatively leak tight.

No violations or deviations were identified.

8. Independent Inspection (40500)

Weaknesses in Timely and Thorough Assessment of Plant Problems or In Effective Communication of Actions to the NRC

The inspector monitored the licensee's performance in assessing events and plant problems that had recently occurred. In general, licensee performance has been adequate in implementing timely and effective corrective action for plant problems. However, there were several examples where the NRC considered that performance could have improved or that more effective communications of assessments and corrective actions could have been provided to the NRC. In addition to past issues (e.g., Unit 1 refueling water storage tank leakage discussed in Inspection Report 206/92-12), recent examples concerned pressurizer instrument line leakage in Unit 3, 125 VDC vital battery cracking in Unit 3, and valve HV852B accumulator nitrogen leakage in Unit 1. The concerns were as follows:

a) Pressurizer Instrument Line Leakage in Unit 3

On July 20, 1992, the licensee determined that there was a problem with one of the pressurizer level instruments. The licensee sampled the containment normal sump and found high levels of tritium which indicated pressurizer steam space leakage. The licensee concluded that the steam space leakage was linked to the problems noted with the pressurizer level instrument.

The small amount of leakage (.076 gpm) was evident by a 5.5% high deviation in level in Channel Y, transmitter 3LT01102, in comparison to the redundant channel. It was believed that such a deviation could be caused by a leak in the reference leg of the transmitter. As a result, the licensee initiated non-conformance report (NCR) 92070079 to assess the implications of the leak on the operation of the Unit.

During discussions with the licensee, they were not able to exclude the possibility that the leak was from the reactor coolant system pressure boundary. However, they believed that the leak was most likely from the reference leg isolation valve (e.g., body to bonnet canopy weld), the flexible hose connecting the transmitter tubing to the isolation valve, or the connections between the tubing and the flexible hose. The licensee also believed that the leakage source was downstream of a loss-of-coolant-accident (LOCA) limiting orifice. Thus, a break would be limited to within analyzed values.

The NRC staff was concerned that a crack in small bore tubing or piping such as this could lead to small break LOCA event. Data suggested that a leak before break scenario with slow propagation was not as credible in small bore tubing as it was in large diameter piping. Subsequent discussions with the licensee revealed that they were not aware of this concern, but would consider it in future situations.

Subsequent observations indicated that the licensee's technical judgement of the situation was correct. However, the NRC was concerned that they did not perform a visual inspection of the plant equipment until questioned by the NRC, even though discussions failed to disprove the presence of pressure boundary leakage. The NRC considered that, given that the leakage was unidentified leakage, and that it was possible that it may not have been isolable, it would have been prudent for the licensee to conduct a visual inspection without NRC involvement.

b) Vital Battery Cracks in Unit 3

On July 14, 1992, the licensee identified that cell # 14 of vital battery 3D1 (125 VDC) had a terminal voltage less than required by Technical Specifications (TS). As a result, the licensee initiated NCR 92070043 to assess the implications of jumpering out that cell and jumpering in cell 53.

Cell 53 had been jumpered out of the battery with its adjacent cell, number 54, in May 1992, as a result of several cracks that radiated out from one of the posts on the top of cell 54 (cells 53 and 54 are located in the same jar). Since the licensee was in a short duration action statement (two hours) with cell 14 inoperable, they performed a quick evaluation of continued operation with cell 53 jumpered in and determined that it would not adversely impact battery operability. This was then supported by the licensee's evaluation of the applicability of a Wyle Laboratory test report for similar cells with cracks from batteries at Palo Verde Nuclear Generating Station. Portions of the test report were received by the Nuclear Engineering Design Organization (NEDO) on July 14 and evaluated. However, the entire test package was not received until July 17 and the NEDO review was not completed until July 23, 1992.

The inspector was concerned with the licensee's evaluation of the condition as detailed in NCR 92070043 as follows:

- The NCR gave the impression that the licensee had looked at the issue in more detail than they really had, given that it was a 2 hour TS action statement. In fact, the licensee did not have the opportunity to review the partial Wyle test results until a day later, and the full Wyle test package several days later. For example, the licensee indicated in the NCR that no additional cracking resulted during the Wyle test of the Palo Verde battery cells. However, if they had reviewed the preliminary test package in more detail, they would have found that some additional cracking took place during the seismic shake test. It appears that the licensee reached some conclusions based on a limited review of the information.

- The licensee indicated that the mechanism causing the existing seal nut and jar lid cracking was corrosion induced. The licensee indicated that a qualitative assessment by the site materials specialist concluded that it was not expected that the existing jar lid cracks in cell 54 would propagate into the jar wall or the other cell. However, there was no justification documented to support this assessment.

- The NCR indicated that a seismic test of several cells with existing jar lid cracks was conducted by Wyle Labs. The tests (of similarly designed cells used at Palo Verde) showed that the cells remained operable after a seismic event. The licensee's NEDO organization completed their evaluation of the Wyle report and considered that it was applicable to SONGS. However, the NRC reviewed the Wyle test report and had a number of questions regarding the acceptability of the test. For example, the NRC staff questioned whether or not capacity tests for the cracked jars were required to demonstrate that the cells could perform their safety function after a seismic event (in accordance with American Nation Standards Institute/Institute of Electronic and Electrical Engineers (ANSI/IEEE) Standard 535).

The NRC also questioned the lack of acceptance criteria and requirements for monitoring electrical functions such as current and voltage during and after the seismic tests.

As a result of the above observations, the NRC was concerned that the licensee made their judgements without having a detailed assessment that was applicable to SONGS until nine days after the problem was identified. In addition, several questions remained unresolved as of the end of this inspection period. The inspector noted that additional corrective actions were implemented after the close of this inspection period. In particular, the licensee added a temporary battery rack and jumpered in four new cells (in place of cells with existing cracks).

Discussions with the Vice President and Site Manager indicated that the licensee agreed that they did not do a complete analytical evaluation, but they believed that their engineering judgement at the time was satisfactory. The NRC is still reviewing this matter.

c) Nitrogen Leakage from Unit 1 Valve HV852B

As discussed in Paragraph 15.e, the inspector was concerned that the knowledge of the personnel evaluating the condition of HV852B was insufficient to identify that the excessive nitrogen leakage could affect piston positions and valve stroke timing. In this case, the technical judgement of the condition was not adequate and a more timely and thorough assessment of the problem could have prevented further degradation of the valve. In addition, ultrasonic testing of similar valves would have been appropriate to ensure operability when the problem with HV852B was first identified.

The NRC considered that, in general, the licensee correctly assesses plant problems and effects timely resolution. A recent example was noted when the licensee entered Unit 2 containment to verify adequate reactor coolant pump (RCP) 2P003 oil sump level when anomalies were noted with the sump level transmitter. Although the licensee was correct in their assessment, as discussed in the first example, a visual assessment of the instrument leakage would have left no doubt as to the condition of the pressurizer instrument line. In the second example, a detailed assessment of the battery cracks took a week and the NRC considered that it was still inconclusive. In the third example, the licensee was not correct in their technical judgement of the significance of nitrogen leakage in HV852B. As a result, the NRC stressed the importance of timely and accurate assessment of emerging plant problems and encouraged continued licensee emphasis in this area, accompanied by more effective communications of these problems to the NRC.

No violations or deviations were identified.

9. Electrical Maintenance (62705)

The inspector continued with a review of electrical maintenance issues. In particular, the licensee's performance of battery surveillance testing was reviewed during this inspection period. In general, surveillances were performed adequately. However, one concern was identified as discussed below.

On the morning of July 14, 1992, the licensee identified that cell 14 of 125 VDC vital battery 3D1 had an individual cell voltage (ICV) reading less than required by TS. As a result, the licensee initiated NCR 92070043 to assess the implications of jumpering out that cell and jumpering in cell 53 as discussed in paragraph 8b.

The inspector noted that as soon as the problem with cell 14 was identified, maintenance personnel stopped, as required by procedure, and contacted appropriate personnel for resolution of the inoperable cell. As a result, the inspector was concerned that the licensee did not check the specific gravities of the cells after the ICV measurements revealed that cell 14 was inoperable. Apparently, the assumption in the procedure was that there was no reason to believe that there might be multiple cell failures. The inspector noted that approximately 12 hours passed before the surveillance testing of the battery was continued. Engineering evaluations had been performed assuming only one inoperable cell.

The inspector noted that cell 29 in battery 3D1 had been a poor performer for several years. During performance of the July 14 surveillance test, the specific gravity of cell 29 was greater than 20 points below the average of the rest of the cells. However, the specific gravity of the cell was greater than 1.195 (a TS limit). Thus, the cell was operable although degraded. The inspector was concerned that if the cell had been inoperable on low specific gravity, it would not have been noticed until the evening of July 14, long after the two hour TS action had expired.

The inspector discussed with the Maintenance Manager the concern that current battery surveillance test methods could prevent detection of multiple inoperable cells for periods of time exceeding TS allowable. The Maintenance Manager indicated that he would evaluate the inspector's concern. This evaluation will be reviewed as part of the routine inspection effort.

No violations or deviations were identified.

10. Discrepancy Between Simulator And Control Room Panel (71707, 37700, 37701)

On June 3, 1992, the inspector was observing simulator training activities when a difference between the simulator and the Units 2 and 3 control panels was noted. The inspector discussed this condition with the control operators and the simulator instructors and noted the following discrepancy.

In 1988, an NRC safety system functional inspection of several safety systems identified a concern with operation of the component cooling water (CCW) system. The concern was that the CCW surge tank outlet valves would shut on a low-low level in the tank to prevent air binding of the CCW pumps. However, it was postulated that this isolation feature could result in a loss of net positive suction head for the pumps during a seismic event concurrent with a break in the non-critical CCW loop. As a result, the licensee removed the surge tank outlet valve thermal overloads.

The change to the physical configuration of the plant was such that removal of the thermal overloads would prevent operation of the valve from the control room or on a low surge tank level. The valves had to be shut locally by manual operation. However, this design change was not reflected in the simulator as observed during the scenario when the valve closed automatically.

The inspector discussed this concern with the licensee who had performed an assessment of the situation. Surveillance report SOS-235-92 documented the licensee's review. The licensee found that the change to the valve control circuitry was assessed through the disposition of an NCR, and it was to be implemented by a maintenance order (MO) and a proposed facility change (PFC). The licensee determined that implementing the change in this manner was allowed by procedure. The evaluation revealed that the MO was implemented, but, the PFC was not. Instead, a retrofit problem report (RPR) was written in 1989. The Construction Organization (also referred to as "Projects") was unable to implement the PFC due to disagreements between Operations and the Nuclear Engineering and Design Organization (NEDO) as to what the full scope of the change would be. The RPR remained unanswered since 1989 and went into the backlog of items awaiting attention by the licensee.

The licensee determined that Units 2 and 3 operated in a plant configuration that was not reflected in the appropriate design documents or in the simulator for over 4 years. The licensee considered that there was no programmatic or procedural non-compliance with this concern. However, the root cause was that existing programs did not make supervision and upper management aware when due dates were not met, allowing a backlog of documents to accumulate.

In addition to the concern with the backlog of items, the inspector noted that in this instance, a poor interface between and within organizations existed. In particular, Operations did not like the PFCs, the Station Technical engineers were not aware of the status of their assigned system configurations, and it appeared that STEC was expecting NEDO to do all of the design corrections and changes without NEDO being aware of that expectation.

Corrective actions included revising the appropriate design documents to correctly reflect that the thermal overloads (for the respective CCW surge tank outlet valves) had been removed. The simulator was brought up to date on June 12, 1992. In addition, the licensee was in the process of modifying procedures to require higher levels of management review to ensure that each backlog item received an adequate evaluation.

The inspector considered that the effort by the Nuclear Oversight Division to determine the scope and the root cause of this problem to be critical and thorough. The inspector also noted that the licensee has been aggressively pursuing the reduction of backlog items so that items such as this should be identified and resolved in a more timely manner.

No violations or deviations were identified.

11. Review Of Licensee's Measuring And Test Equipment Program (56700)

The inspector performed a review of the licensee's measuring and test equipment (M&TE) program to determine if the portable equipment was properly controlled and capable of ensuring the operability of installed plant equipment. The inspector found that the control of M&TE equipment was very difficult to audit. In addition, the inspector considered that the M&TE program was poorly defined and that the proper implementation of the program relied heavily on the M&TE supervisor.

The inspector noted that the program was difficult to audit since portions of the documentation were located at the site and the remainder were at the licensee's Shop Services and Instrumentation Division (SSID) facility in Westminster, California. In addition, much of the documentation had to be indexed and cross-referenced manually. Equipment "travelers" (used to monitor the use of M&TE as discussed below) was one type of document that was particularly difficult to retrieve.

The inspector considered that the poor program definition could lead to installed plant instrumentation being out of tolerance for long periods of time based on the following observations:

- M&TE used in performing a maintenance activity was recorded in the Maintenance Order (MO). It takes many months for the MO and M&TE information to get recorded in the computer database. As a result, the licensee had implemented a document called a "traveler" which was provided to the technician with each piece of M&TE issued from the tool room. The user recorded on the traveler (not a controlled document) which maintenance/surveillance activities the piece of M&TE was used in. When the M&TE was returned, the traveler information was loaded into a database for tracking its use. Thus, if a calibration failure notice (CFN) was issued on that M&TE, the plant equipment that it was used on could be easily tracked.

  This system places heavy reliance upon individuals to properly fill out this paperwork and return all pages to the tool room upon completion of use. This was complicated somewhat by the fact that procedures allowed different individuals to use the same piece of test equipment (M&TE). Therefore, the person responsible for the accuracy of the traveler would change. If a page was lost or information was improperly recorded, then usage of the M&TE on plant equipment could not be established until the MO was loaded into the database some months later. If no usage was shown in the computer (e.g., a lost traveler), then the CFN would not get evaluated for potential impact on installed plant equipment. The only exception was M&TE used by the Quality Control (QC) organization, which has its own program for dealing with CFNs.

- Approximately one-third of the time, CFNs went unanswered or unassessed for more than 30 days.

- The requirements for what to do when a piece of M&TE had sequential calibration failures were not well defined in the SSID or site procedures.

- Procedural guidance was weak in defining the situations when technicians needed to verify the accuracy of test equipment before or after using it on installed plant equipment. Thus, if a piece of M&TE had gone out of calibration during the interval, this fact may not be identified until it was sent to SSID for a calibration check. This could result in a long interval in which the calibration status of plant equipment could be in question.

- There was no easy way to find a detailed history of calibration failures in the measuring and test equipment data base. Thus, a technician would not know if there had been a history of problems with the equipment being used.

- When a CFN was received from SSID, the first line supervisor was responsible for evaluating the condition and the M&TE supervisor verified the first line supervisor's assessment. The inspector noted that the resolution of the M&TE supervisor's comments contributed to the excessive time used to respond to CFNs.

- It took greater than 30 days (40% of the time) for the M&TE to be calibrated and returned to the site after being sent to SSID. This could lead to excessive periods during which plant equipment could be out of calibration.

The inspector discussed these concerns with licensee management. To the licensee's credit, a quality action team (QAT) was assembled to address other M&TE issues (such a temperature sensitivities of M&TE) as a result of a Nuclear Oversight Division audit. The inspector noted that the QAT was aware of the extensive time to return M&TE after it was sent off-site and the excessive time to respond to CFNs. The licensee indicated that the QAT would factor the inspector's concerns into their evaluation of the M&TE program. The inspector also noted that the licensee was in the process of implementing a program to track the history of calibration failures of equipment.

As of the end of this inspection period, no operability issues were identified. However, the inspector was in the process of performing documentation reviews to determine if personnel practices were adequate to compensate for the weaknesses in program definition. The inspector will continue a review of M&TE activities as a Followup Item (50-361/92-23-01).

12. Verification Of Plant Records (TI 2515/115)

Temporary Instruction (TI) 2515/115 to the NRC Inspection Manual was issued to provide guidance for evaluating each licensee's ability to obtain accurate and complete log readings from either licensed or non-licensed personnel. The inspector reviewed the licensee's program to determine if SCE had implemented a self-monitoring program which could detect plant mechanics, technicians, or operators whose practices might have included falsifying logs.

The inspector discussed this issue with the licensee in June 1992. At the time, the licensee did not have a program to verify plant records. However, after review of the issue, as discussed in NRC Information Notice 92-30, "Falsification Of Plant Records," the licensee elected to implement such a program. In August 1992, the licensee issued quality assurance guideline (QAG)-005 to provide a periodic surveillance program for comparative analysis between documented division surveillance requirements and security access records data.

The inspector reviewed the QAG and considered that it would be effective in detecting personnel practices which might lead to falsified log readings. The inspector also noted that the Vice President and Site Manager issued a memorandum to all nuclear organization personnel on May 21, 1992, dealing with the issue.

The licensee also performed an assessment of log keeping practices of plant equipment operators for the period of April 4 to April 7, 1992. Several inconsistencies with operator round sheets were noted and documented in surveillance report SOS-195-92, "NRC Information Notice 92-30: Falsification Of Plant Records." In particular, the following concerns were identified:

o A non-licensed nuclear plant equipment operator (NPEO) did not make the required vital area entries to perform shiftly surveillances on three occasions, but signed the surveillance indicating that he had. According to the licensee's surveillance, on March 8 and April 4, 1992, the night shift Radwaste NPEO (commonly referred to as the 43 position) was required to enter the Units 2 and 3 control element drive mechanism control system (CEDMCS) vital area by procedure SO23-0-9, TCN 0-29, "Routine Rounds and Inspections." The NPEO was required to make a general area inspection of equipment (e.g., panels, motor-generators, relays, etc.) in the Unit 2 CEDMCS room as required by the rounds sheet and document any abnormalities. However, contrary to the requirement of the operator rounds sheet, the assigned responsible NPEO did not enter the area as reflected by plant security data. In addition, on March 18 the same operator did not enter the Unit 2 main steam isolation valve area on March 18, 1992, as required by the (23 position) operator round sheet. In this case, the NPEO was required to make a general area inspection and take specific readings of instrumentation associated with the atmospheric dump valves, main steam isolation valves, and other safety-related equipment.

In the cases discussed above, there did not appear to be any safety significance to the failure to make the appropriate area entries since subsequent operator rounds indicated that the equipment was functioning properly. The licensee took disciplinary actions against the equipment operator. Failure to take and record information that is complete and accurate in all material respects is an Unresolved Item pending the NRC's determination of the policy for handling these types of record discrepancies (Unresolved Item 50-361/92-23-02).

- Three examples were identified in which two NPEOs allowed their trainees to enter an area without the assigned responsible NPEO in attendance to perform rounds required by SO23-0-5, TCN 0-1, "Plant Equipment Operator's Responsibilities and Duties." In particular, on April 6, 1992, the responsible NPEO (turbine building 24 position) did not enter the Unit 2 non-1E uninterruptible power supply (UPS) vital area or the Unit 2 salt water cooling (SWC) pump room. On April 7, 1992, the (24 position) NPEO did not enter the Unit 2 non-1E UPS vital area. In addition, on April 8, 1992, the (24 position) NPEO did not enter the Unit 2 non-1E UPS area or the Unit 2 SWC pump room. Instead, on these occasions, non-qualified trainees entered these areas to take readings.

This practice is contrary to the licensee's procedural requirements. In particular, procedure SO123-0-20, "Use Of Procedures," Revision 0, TCN-6, specified that, "Only qualified operators are permitted to obtain readings required by Operating Instructions unless specifically allowed otherwise by the procedure." In addition, the procedure specified that the assigned responsible NPEOs sign for performance of the surveillance. In the cases discussed, the NPEO was required to make a general area inspection of pumps, motors, piping etc. There did not appear to be any safety significance since subsequent operator rounds indicated that the equipment was functioning properly. The licensee counseled the individuals involved on the inappropriate use of trainees in these instances. This is an Unresolved Item pending the NRC's determination of the policy on handling these types of record discrepancies (Unresolved Item 50-361/92-23-03).

Two unresolved items were identified.

13. Licensee Self Assessment (40500)

a. 50.59 Program Assessment

A resident inspector and the Nuclear Reactor Regulation (NRR) project manager reviewed the licensee's 10 CFR 50.59 evaluation program to determine its adequacy for performing effective safety evaluations.

Attachment 3 to Nuclear Engineering, Safety, And Licensing (NES&L) procedure 24-10-15, "Preparation, Review, And Approval Of Facility Change Evaluations (FCEs) for SONGS 1,2 & 3," was reviewed to determine the adequacy of the program in implementing 10 CFR 50.59 requirements and its conformance with Nuclear Safety Analysis Center (NSAC)-125 recommendations. The inspector also reviewed the licensee's training program and several completed 50.59 evaluations.

In general, it was considered that the program was adequate and conformed to NSAC-125 recommendations. The project manager reviewed a number of safety evaluations and considered that they were adequate. However, the project manager considered that the process by which SCE identifies licensing criteria and their impact on the safety evaluation could be enhanced. In particular, there were examples noted in which the safety evaluations did not list all the licensing criteria considered in the 50.59 evaluation. The project manager attributed the weakness of some safety evaluations to the following observations:

- There was not a formal process for verifying that the proper licensing design bases were chosen by the engineer performing the 50.59 evaluation.
- 10 CFR 50.59 evaluations sometimes did not list the licensing design bases of the components under consideration (e.g., backup nitrogen supply for the CCW surge tank simply stated that CCW performs heat removal from accidents in Chapter 15 of the FSAR). It was not discussed in the safety evaluation which accidents were actually being considered.

The inspector concluded that the licensee's program was adequate and should result in sound, justified safety evaluations. However, the inspector discussed the observations noted above with the appropriate licensee management for evaluation. The licensee's evaluation will be reviewed as part of the routine inspection effort.

b. <u>Operator Performance Issues During The Unit 3 Refueling Outage</u>

As a result of the inspector's concern over the number of operator errors during the Unit 3 Cycle VI refueling outage, the licensee reviewed selected events to determine if there was a common cause. The results of the review were addressed in a memo from C. Chiu to R. W. Waldo and J. L. Reeder, dated August 24, 1992. In that evaluation, the licensee considered that these events were primarily the result of individuals performing tasks that were only done infrequently or individuals performing routine tasks under infrequently occurring plant conditions or system lineups. In addition, the licensee considered that there were weaknesses in the operation and method of controlling operations for the spent fuel pool cooling system.

As corrective actions, the Nuclear Oversight Division recommended that the licensee form a QAT to address improvements in the operation of the spent fuel systems. In addition, prior to future refueling outages, training should develop a lessons learned training course to heighten awareness of things to look for during off normal conditions.

c. Stop Work Order For Welding Operations

On August 25, 1992, the Maintenance Manager issued a stop work order for all welding as a result of a Quality Assurance surveillance that found uncontrolled weld filler material. The order was applicable to all work except that specifically approved by the Maintenance Manager. The majority of the filler material (rods) was found at the Mesa facility and at the Administrative Warehouse & Supply/Shop Building (AWS) machine shop. However, some was found in the plant.

For corrective action, the licensee planned on retaining tight restrictions on the use of filler material and performing a maintenance incident investigation report. As of the end of this inspection period, there were no indications that there was impact on plant safety. The inspector will monitor the licensee's actions to resolve this issue as followup item (50-206/92-23-04).

No violation or deviations were identified.

14. Review of Licensee Event Reports (90712, 92700)

Through direct observations, discussion with licensee personnel, or review of the records, the following LERs were closed:

Unit 1

91-14, Revision 0	"Entry Into 3.0.3 Technical Specifications Due To Inoperable Volume Control Tank Level Transmitter."
92-01, Revision 0	"HV852B Inoperable Due To Hydraulic Accumulator Piston Level."
92-02, Revision 0	"Shift Supervisor And Control Room Supervisor Both Left Control Room."

Unit 2

88-15, Revision 1	"Operator Error Causing Fuel Handling Isolation System Response."
91-08, Revision 0	"Erratic Ammonia Analyzer Caused Toxic Gas Isolation System To Actuate."

92-02, Revision 0 "Inadvertent Control Room Isolation System Actuation."

92-04, Revision 0 "EFAS Manual Actuation After Loss Of One Main Feedwater Pump."

92-09, Revision 0 "Saltwater Cooling Valve MU019 Out Of Position (Closed) Greater Than 72 Hours."

This LER describes the licensee's failure to maintain a pump cooling water valve open and is considered a violation of Technical Specifications 3.7.4. This violation will not be subject to enforcement action because the licensee's efforts in identifying and correcting the violation meet the criteria specified in Section VII.B of the Enforcement Policy.

Unit 3

92-03, Revision 0 "Reactor Coolant Pump Trip Due To Faulted Surge Capacitor."

One non-cited violation was identified.

15. Follow-Up of Previously Identified Items (92701)

a. (Closed) Open Item (50-361, 50-362/91-01-05) "Temperature Sensitivity of Excore Nuclear Detectors"

The NRC instrument and control (I&C) setpoint team noted that the excore nuclear instrument detectors could be subject to elevated temperatures during certain accident conditions. The licensee did not have information on the affect of elevated temperatures on excore detector uncertainty calculations.

As a result of the concern, the licensee obtained vendor certification that the excore nuclear instrument detectors would not be effected by elevated containment temperatures.

The inspector reviewed the vendor information and concluded that it supported the conclusion that excore nuclear instrument detectors would not be effected by elevated containment temperatures. Based on the inspector's review, this item is closed.

b. (Closed) Unresolved Item (50-361, 50-362/91-01-06) "Inaccurate Calculation of Instrument Uncertainties for Emergency Operating Instructions"

The licensee prepared and submitted to the NRC, for approval, a TS amendment requesting that certain transmitter surveillance intervals be changed from 18 months to 24 months. One of the supporting documents for the amendment was Functional Analysis M-89068, "Accident Monitoring System and Remote Shutdown Panel." An NRC I&C setpoint inspection team reviewed Function Analysis M-89068 and found errors in the document. Based on the number and types of errors identified, the team questioned the validity of the document as a supporting document for the TS amendment.

Based on the findings, the licensee:

- withdrew the TS amendment request,
- committed to review the implications of the inaccuracies in M-89068 on their emergency operating instructions, and
- committed to perform a review of the technical validity of M-89068.

The licensee review concluded:

- Calculation M-89068 did not receive the proper engineering and quality assurance review required for engineering documents.
- The results of M-89068 did not support the extension of surveillance intervals.

Based on the NRC findings and the licensee review, the licensee performed new calculations for instrument uncertainties. These new calculations showed that instrument uncertainties were larger than had been previously utilized in certain emergency and abnormal procedures. Based on the results of the new calculations, the licensee concluded that no safety limits would have been exceeded in emergency or abnormal operating procedures. However, the licensee found that conditions such as the lifting of safety relief valves might occur, even when the operators were in compliance with abnormal operating limitations. The licensee concluded that emergency and abnormal operating procedures required revision to incorporate the revised calculated instrument uncertainties. The licensee committed to make these changes.

The inspector reviewed the licensee's administrative actions and found them adequate; therefore, this item is closed.

Review of the new calculations and changes to emergency and abnormal operation procedures will be accomplished as part of Unresolved Item (50-361, 50-362/91-01-09).

c. <u>(Closed) Unresolved Item (50-361, 50-362/91-01-08) "Validation of Study M-89047"</u>

The NRC I&C setpoint team noted that Study M-89047, "Instrument Drift Study," was performed during the same time frame as Functional Analysis M-89068. The team was concerned that the type of errors found in M-89068 were contained in M-89047.

The team noted that in a TS Amendment request, the licensee had stated that M-89047 was based on worst case instrument drift. The team noted that only 1/2 the data was analyzed to determine worst case. Data was available for both increasing data points and decreasing data points. The licensee had only considered the increasing data, which did not always include the worst case drift. The team concluded that the licensee had not used the worst case drift values as stated in the TS amendment request. Based on the problems with M-89068 and the team's finding that the worst case drift data had not been used as stated, the licensee agreed to determine if M-89047 was a valid study.

The licensee acknowledged that the wording of the TS amendment may have been misleading. The licensee hired an independent contractor to validate study M-89047. The contractor, Tetra Engineering Group, concluded that study M-89047 contained valid data. In addition, the licensee refined the study to use all the increasing data points. The inspector questioned the omission of the decreasing data points, and pointed out that many instrument safety functions occur on decreasing data points.

The licensee stated that use of only increasing data points was acceptable because the uncertainty associated with the decreasing data points was covered by a separate uncertainty, hysteresis. The licensee stated that customizing the drift analyses to match the safety function (increasing or decreasing) for each transmitter was an unnecessary complication. The licensee noted that study M-89047 was only for long term drift and not for evaluation of the performance of an individual transmitter.

The inspector reviewed the study validation done by Tetra Engineering Group and the licensee's evaluation of the use of only increasing data for drift studies. The inspector concluded that the study provided acceptable technical information to track long term instrument setpoint drift at SONGS. This item is closed.

d. (Open) Unresolved Item (50-361, 50-362/91-01-09) "Instrument Uncertainties for Emergency Operating Instructions"

The NRC I&C setpoint team determined that the uncertainties for a number of instruments associated with Emergency Operating Instructions were incorrectly calculated in Functional Analysis M-89068. The licensee agreed to recalculate the instrument uncertainties and change the EOIs as required.

As noted in Section 15.b above, the licensee performed new calculations associated with M-89068 and determined that some procedural changes would be required.

NRC review of the new calculations and modified procedures will be accomplished under this Unresolved Item.

e. (Closed) Unresolved Item (50-206/92-20-01) Temporary Waiver of Compliance From Technical Specification 3.3.1 For Safety Injection Valve HV852B

On May 19, 1992, while Unit 1 was at 92% power, main feedwater (MFW) pump discharge/safety injection (SI) isolation valve HV852B was removed from service for corrective maintenance (reference NRC Inspection Report 92-20, paragraph 4.a for further discussion). Maintenance was performed on the valve accumulators to replace the nitrogen addition valves (schrader valves) since the valves were leaking nitrogen. The nitrogen leakage had increased until recharging of the accumulators was performed approximately once every three days.

The design of hydraulic valve (HV) HV852B is to open with a pneumatic-hydraulic pump, and to close (its safety-related function) by two nitrogen-hydraulic fluid accumulators connected to the valve actuator. The nitrogen in the accumulators is separated from the hydraulic fluid by a piston with seal rings. The accumulators were modified in 1976 to use pistons to isolate the hydraulic fluid from the gaseous nitrogen. The nitrogen in the accumulators provides the motive force necessary to displace the hydraulic fluid from the accumulator, which is used to move the valve to its closed SI position. Nitrogen was added to the accumulators by connecting a high pressure nitrogen cylinder to accumulator schrader valves (located on top of accumulators) through a charging manifold.

On May 19, 1992, upon removal of the schrader valves from the top of the accumulators, the positions of the pistons were measured using reach rods. The pistons were found to be mis-aligned, one at the top-most position of its stroke and the other at the bottom-most part of its stroke. Operability of the valve was indeterminate at that time. Station Technical (STEC) initiated an evaluation, but an NCR (which was required for conditions of this type) was not initiated until approximately one month later, on June 17, 1992. The inspector reviewed the NCR procedure and noted that there were no requirements with respect to timeliness of issuing NCRs for non-conforming conditions. The mis-alignment of the pistons had occurred due to leakage from one of the accumulator schrader valves being greater than the other.

Immediate corrective actions consisted of replacing the schrader valves, restoring the pistons to an even alignment, recharging the accumulators with nitrogen, and returning HV852B to service on May 19, 1992.

On June 23, 1992, STEC, in conjunction with vendor calculations, concluded that HV852B was inoperable in the as-found condition on May 19, 1992. Calculations performed by the vendor indicated that with the nitrogen and hydraulic fluid volumes as found, HV852B would have stroked closed only 95% of its required travel. With HV852B inoperable, Unit 1 Technical Specifications (TS) 3.3.1, "Safety

Injection, Recirculation, and Containment Spray Systems" required entrance into TS 3.0.3 because TS 3.3.1 did not provide an action statement for the inoperability of HV852B. Technical Specification 3.0.3 required HV852B to be returned to operable status within one hour or commence a reactor shutdown. On July 23, 1992 the licensee submitted Unit 1 Licensee Event Report (LER) 1-92-01 describing the events surrounding the inoperability of HV852B.

Failure of valve HV852B to fully close (there is one valve per SI train) was not a safety significant issue because downstream main feedwater (MFW) regulating, bypass, and motor operated isolation valves also receive a signal to close on safety injection initiation. These downstream valves were designed to close against full system pressure, were incorporated into the valve inservice testing program, were safety-related valves, and would close in a time frame similar to HV852B. The inspector reviewed records for previous stroke time testing of these valves and found them to be satisfactory. Therefore, in the event of a failure of the HV852 valves to fully close, flow to the SGs would have been isolated by the MFW regulating, bypass, and motor operated isolation valves.

The inspector noted that valves HV854A,B and HV852A,B (four valves total) are of the dual accumulator design. Without a surveillance program to monitor the piston position in the accumulators, there was a potential for all four valves to be affected similarly by continued nitrogen leakage. Valves HV854A,B and HV852A were verified in June 1992 to have the accumulator pistons in such a position that valve operability was not affected. In addition, there had been no excessive nitrogen leakage noted by licensee personnel of the accumulators for these valves.

The inspector noted that had one of the HV854 valves been found not able to fully close (one HV854 valve per SI train), this would have been much more significant. The HV854 valves close on SI actuation to preclude injecting unborated water from the condenser into the reactor coolant system (RCS). A failure of the HV854 valves to fully close would have prevented injection of borated water from the refueling water storage tank to the RCS. This was because the HV851 (SI outlet valves to RCS) valves were interlocked such that they would not open until the HV854 valves were fully closed.

Based on the events associated with HV852B and the review of LER 50-206/92-01, the inspector had the following concerns:

- Vendor manuals and maintenance procedures did not provide adequate information for on-line charging of the HV accumulators (HV851, HV852, HV853, and HV854) in that the information provided was based on maintenance being done in the maintenance shop rather than in the field.

- Even with vendor assistance, when developing the initial accumulator recharging procedures in 1986, the potential for piston mis-alignment as the result of accumulator leakage was not recognized.

- The knowledge level of the personnel evaluating the condition of HV852B was insufficient to identify that excessive leakage could affect piston positions and stroke time, and therefore valve operability. The inspector noted that early discussions with personnel indicated that the repeated charging was considered to be acceptable.

- The potential impact of the increased accumulator charging frequency was not discussed with the vendor until May 1992.

- Neither vendor nor SCE instructions identified the importance of checking accumulator piston location, especially regarding frequent accumulator recharging. There were no programs, such as routine surveillances, to check piston locations. Such activities would have clearly identified degrading conditions (i.e., accumulator pistons changing locations). Further, the inspector noted that the licensee had no formal program to check sub-components of equipment to ensure that they will function properly.

- On June 17, 1992, a Temporary Waiver of Compliance was requested to regain lost margin for the HV851A accumulator piston due to leakage from the hydraulic oil side of the accumulator (for further discussion reference NRC Inspection Report 92-20, paragraph 4.b). Prompt verification of other accumulator piston locations, after HV852B was discovered in an inoperable condition, would have identified that HV851A was degrading due to hydraulic oil leakage earlier.

The inspector concluded that the increased accumulator leakage and repeated charging was not recognized by SCE as a condition which could affect valve operability. In addition, an NCR to evaluate the as found condition of HV852B was not written for almost one month. Also, other MFW and SI accumulator piston locations were not determined until over one month after discovering HV852B in its degraded condition. While the actual safety significance of the valve inoperability is low as described above, the inspector considered that the inoperable condition of HV852B as found on May 19, 1992, was a violation in that the licensee actions were inadequate to quickly identify and correct the degraded condition of HV852B (50-206/92-23-05).

Additionally, the inspector noted that there was not a formal program to check the sub-components of the accumulators. In the absence of knowledge as to the impact of nitrogen leakage and in the lack of a surveillance program to monitor accumulator piston locations, HV852B continued to degrade over a three month period.

One violation was identified.

16. Follow-Up of Items of Non-Compliance (92702)

(Closed) Violation (50-361, 50-362/91-01-07) "Inaccurate Technical Information in a Technical Specification Amendment Request"

The NRC I&C setpoint team found that the licensee had submitted TS Amendment requests based on incorrect engineering calculations. These calculations were contained in Functional Analysis M-89068.

The licensee subsequently withdrew the amendment request. The licensee determined that Functional Analysis M-89068 had not received the normal engineering and quality review required for engineering calculations.

The licensee issued changes to Engineering, Safety and Licensing Department Procedures 24-7-15, Revision 7, PCN 3, "Preparation and Verification of Design Calculations, and 24-10-9, Revision 3, PCN 2, "Design Process Flow and Controls SONGS 1, 2 & 3." These changes specified that studies and analysis used as official documents shall have formal engineering and quality reviews.

The inspector reviewed the administrative document changes and concluded that the changes required adequate engineering and quality review; therefore, this item is closed.

Technical issues associated with the errors in Functional Analysis were discussed in Paragraph 15.b, Unresolved Item (50-361, 50-362/91-01-06). Final NRC review of new calculations and operating procedures associated with Functional Analysis M-89068 will be performed during review of Unresolved Item (50-361, 50-362/91-01-09).

17. Meeting with Southern California Edison (SCE) Managers in Region V Office

On August 18, 1992, SCE managers, M. Short, R. Rosenblum, B. Carlisle, and G. Hammond, came to the NRC Region V Office to discuss some recent technical issues occurring at San Onofre. The NRC personnel present for the discussions were K. Perkins, H. Wong, and D. Chaney. The issues discussed included the Unit 3 pressurizer level instrument line leak, a temporary modification to the containment purge system, and re-organization of the Station Technical engineering organization. The SCE handouts used in this meeting are attached.

Mr. Perkins discussed the need for making conservative operating decisions and encouraged continued open exchange of information between all groups. Mr. Perkins also emphasized that early discussion of issues was important in order for the NRC to be able to completely understand the development of the issue. The SCE personnel agreed and to the extent possible would do so. Mr. Perkins stated that the meeting was beneficial in understanding more fully the technical issues and also the SCE thought process in dealing with these issues.

18. Unresolved Item

Unresolved items are matters about which more information is required to determine whether they are acceptable items, violations or deviations. Unresolved items addressed during this inspection are discussed in paragraph 12 of this report.

19. Exit Meeting

On August 26, 1992 an exit meeting was conducted with the licensee representatives identified in Paragraph 1. The inspectors summarized the inspection scope and findings as described in the Results section of this report.

The licensee acknowledged the inspection findings and noted that appropriate corrective actions would be implemented where warranted. The licensee did not identify as proprietary any of the information provided to or reviewed by the inspectors during this inspection.

SAN ONOFRE UNIT 3 PRESSURIZER INSTRUMENT VALVE CANOPY SEAL LEAK

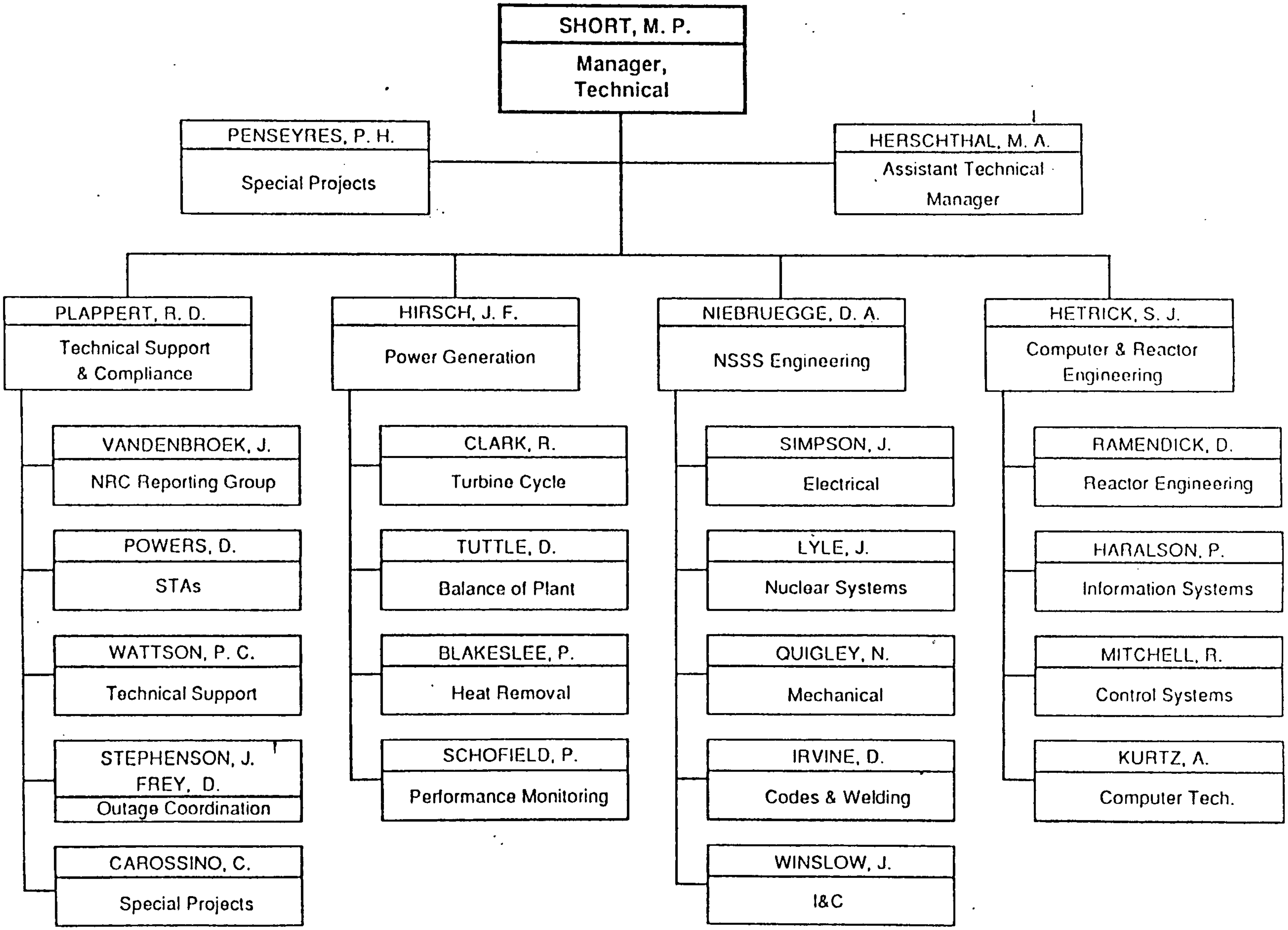
INTRODUCTION:

- On 6/14/92, Pressurizer Level Anomoly in Y Channel
- Transmitter Replaced and Channel Returned to Service
- On 7/20/92, Pressurizer Level Control Anomoly in Y Channel
- Performed:

  Loop Check/Calibration - No Problems Identified
  ECAD - No Relevant Problems Identified

- Attempts to Re-Calibrate Transmitter In Containment Identified Feedback Coil Misaligned
- Replaced Transmitter
- 5.5% Deviation Still Present
- Suspected Deviation Due to Leak In Reference Leg

STATION TECHNICAL DIVISION

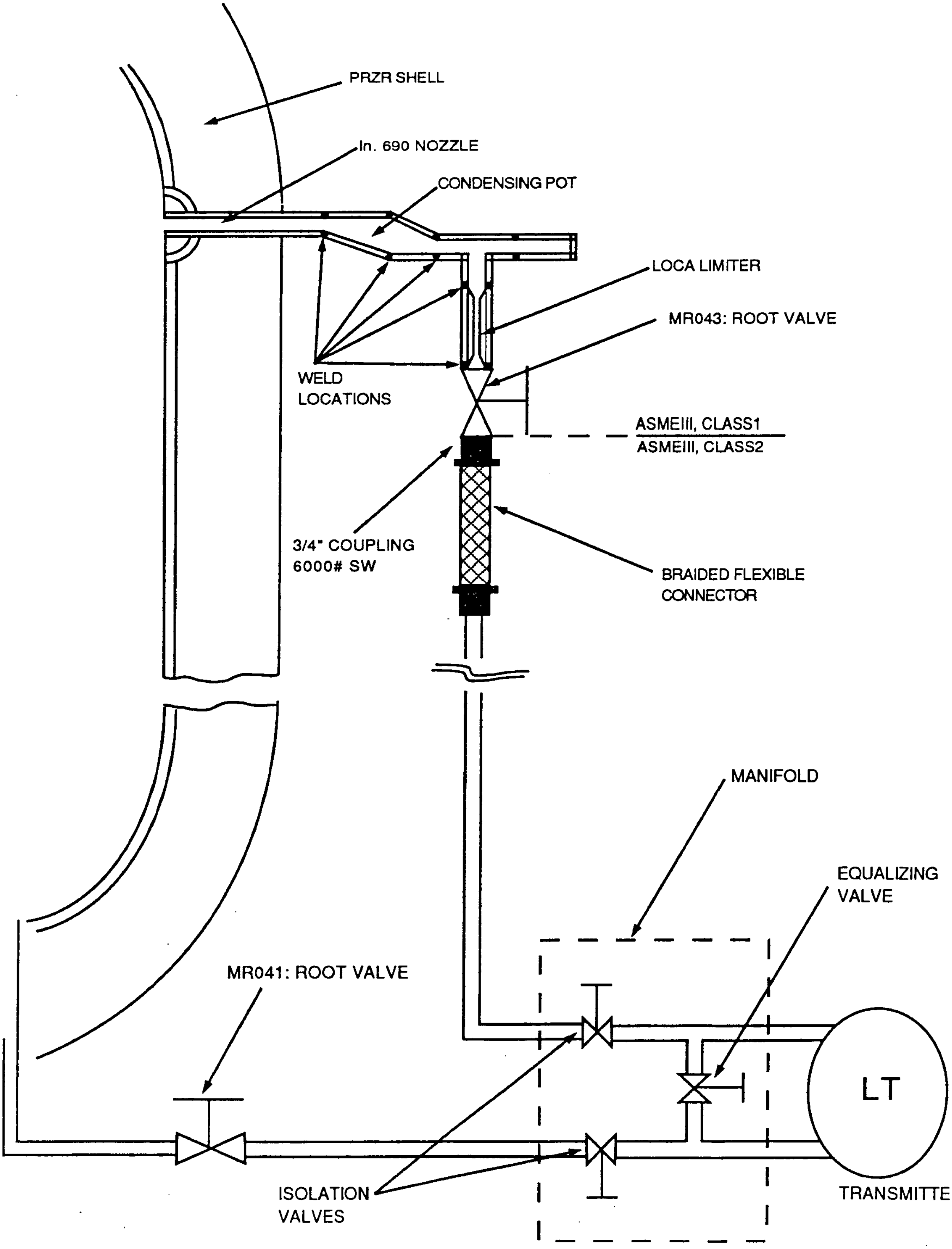


- **SHORT, M. P.** – Manager, Technical
  - PENSEYRES, P. H. – Special Projects
  - HERSCHTHAL, M. A. – Assistant Technical Manager
  - PLAPPERT, R. D. – Technical Support & Compliance
    - VANDENBROEK, J. – NRC Reporting Group
    - POWERS, D. – STAs
    - WATTSON, P. C. – Technical Support
    - STEPHENSON, J.
FREY, D. – Outage Coordination
    - CAROSSINO, C. – Special Projects
  - HIRSCH, J. F. – Power Generation
    - CLARK, R. – Turbine Cycle
    - TUTTLE, D. – Balance of Plant
    - BLAKESLEE, P. – Heat Removal
    - SCHOFIELD, P. – Performance Monitoring
  - NIEBRUEGGE, D. A. – NSSS Engineering
    - SIMPSON, J. – Electrical
    - LYLE, J. – Nuclear Systems
    - QUIGLEY, N. – Mechanical
    - IRVINE, D. – Codes & Welding
    - WINSLOW, J. – I&C
  - HETRICK, S. J. – Computer & Reactor Engineering
    - RAMENDICK, D. – Reactor Engineering
    - HARALSON, P. – Information Systems
    - MITCHELL, R. – Control Systems
    - KURTZ, A. – Computer Tech.

"OLD"

7/92

TYPICAL PRZR. INSTR. NOZZLE CONFIGURATION



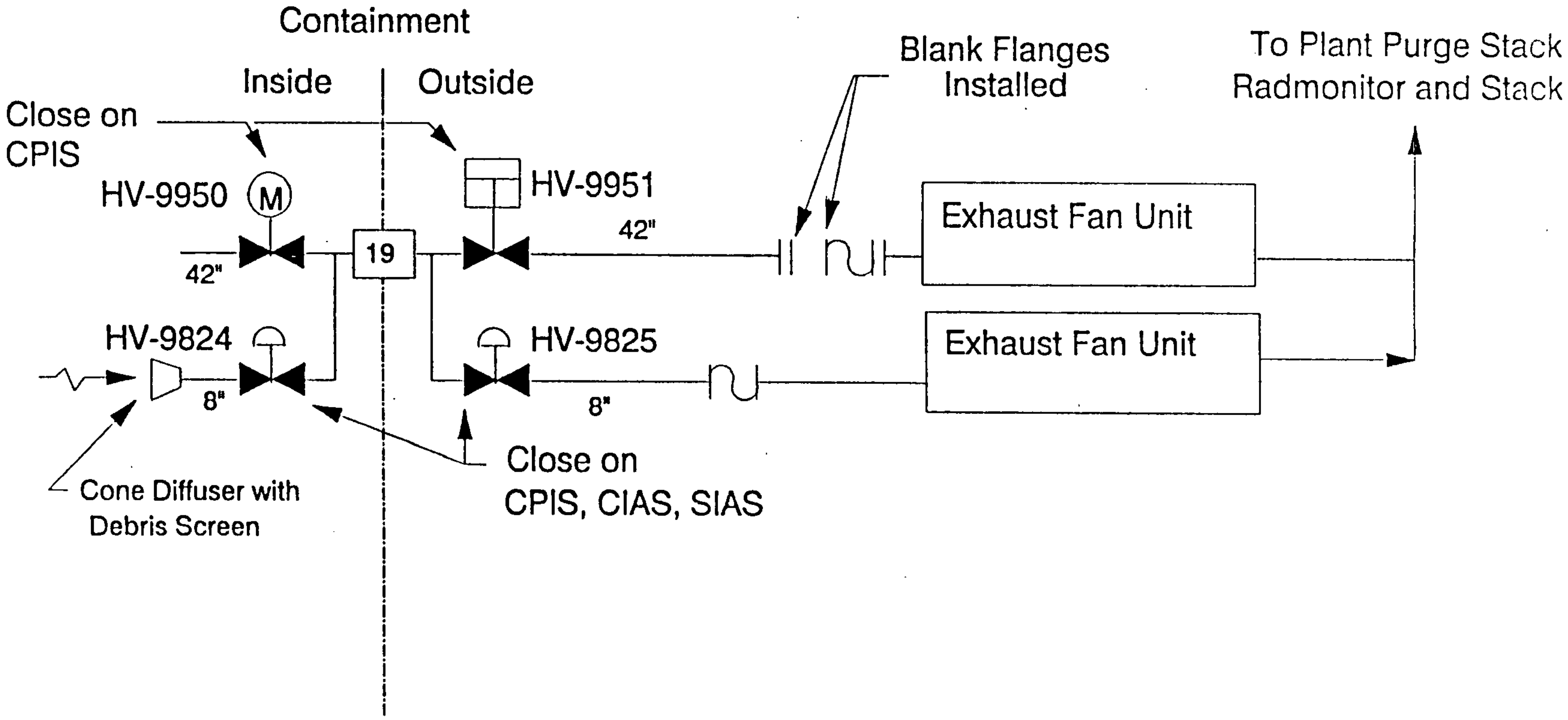
UNIT 2 CONTAINMENT PURGE EXHAUST INTRODUCTION

BACKGROUND

TEMPORARY FACILITY MODIFICATION

PLANS TO CORRECT CAUSE OF LLRT FAILURE

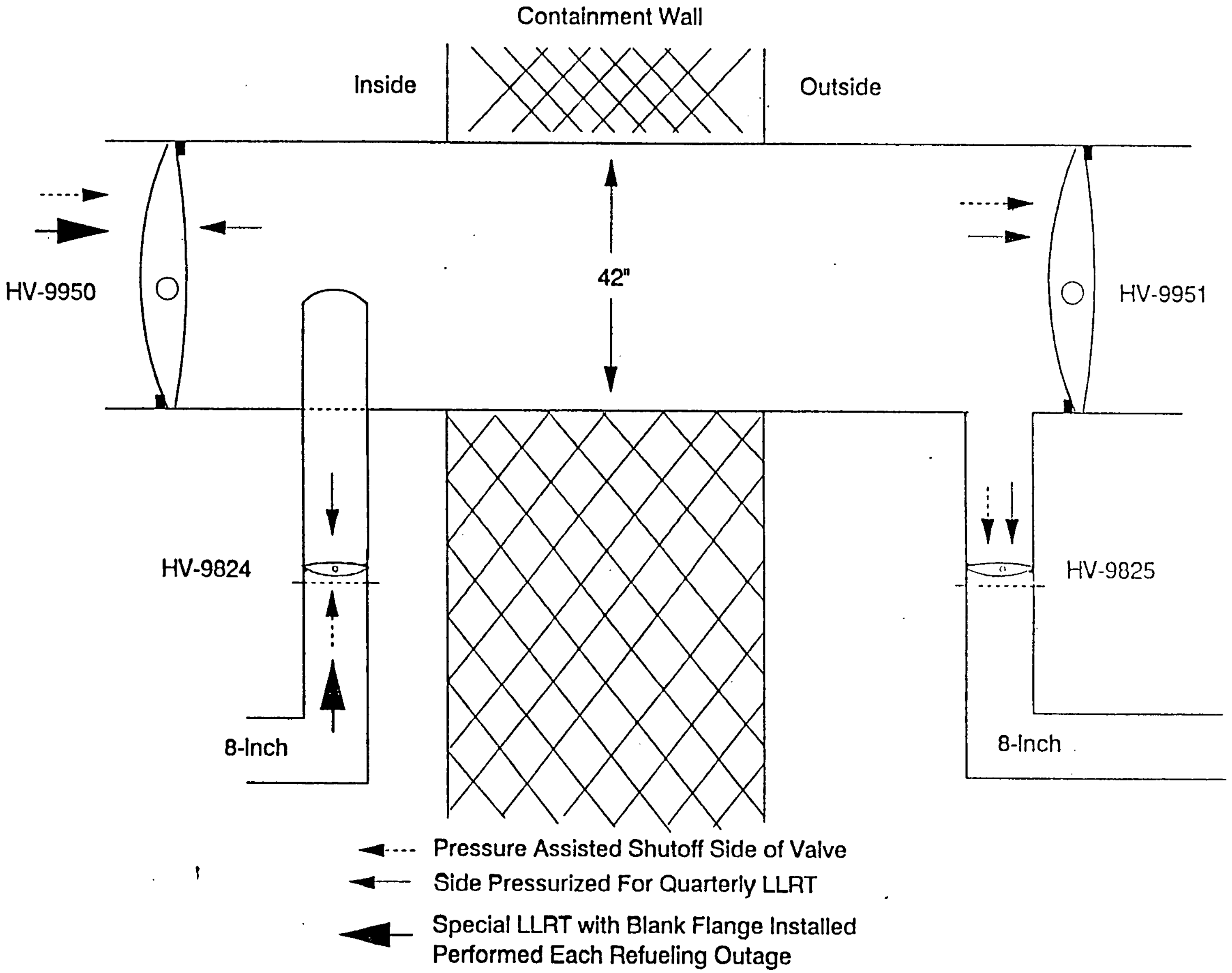
LONG TERM CORRECTIVE ACTIONS



Containment Purge Exhaust System

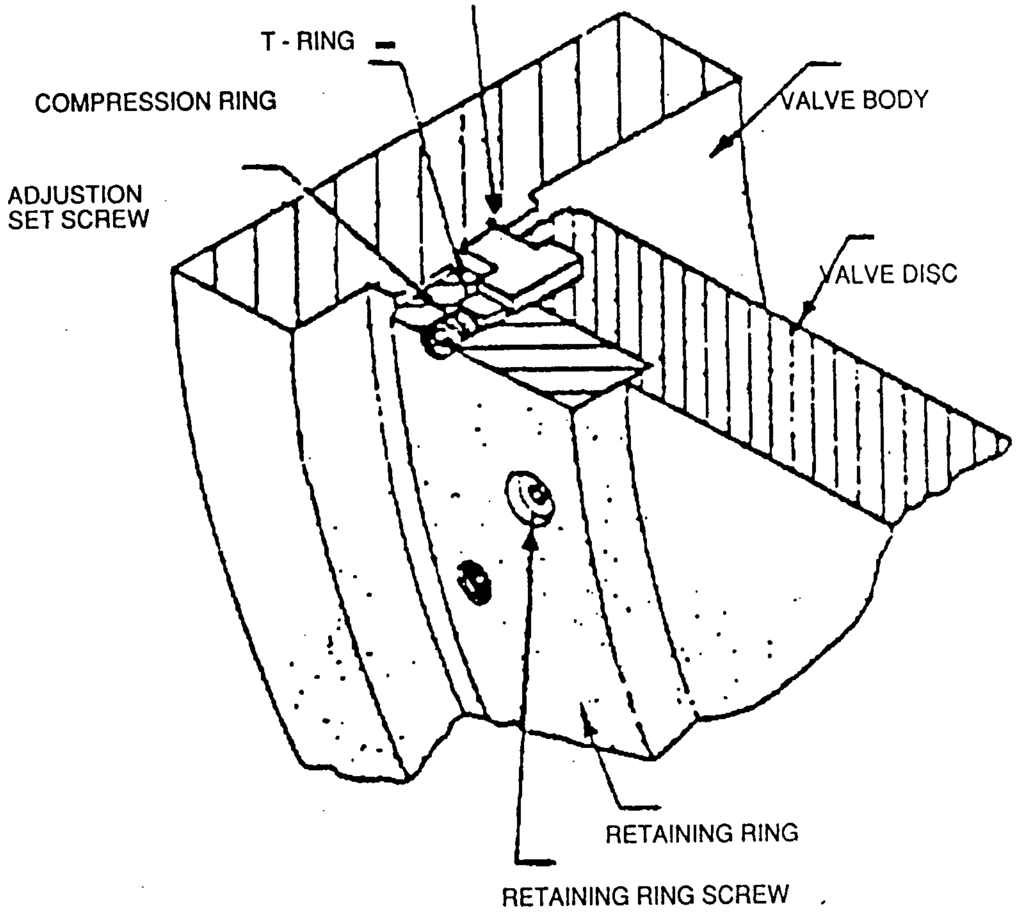
BACKGROUND - APPLICABLE TSs
(Modes 1 through 4)

Technical Specification	Limiting Conditions for Operations	Action Requirement(s)
3.6.1.7, Containment Ventilation System	a. 42" purge valves maintained closed b. 8 " mini purge valves closed to the maximum extent practicable	a.1 Close / blind flange in 4 hours, else Mode 3 in next 6 hours and Mode 5 in next 30 hours. a.2 If open for other than allowable, close *or* blind flange in 4 hours, else Mode 3 in next 6 hours and Mode 5 in next 30 hours b. If a 42" or 8" isolation valve leakage exceeds 0.05 L_a at P_a during LLRT, fix *or* blind flange in 24 hours, else Mode 3 in next 6 hours and Mode 5 in next 30 hours
3.6.3, Containment Isolation Valves	Maintain Valves Operable	Restore to operability *or* isolate penetration in 4 hours, else Mode 3 in next 6 hours and Mode 5 in next 30 hours
3.6.1.2, Containment Leakage	Combined leakage < 0.75 L_a at P_a LLRT Leakage < 0.6 L_a at P_a	Prior to RCS temperature exceeding 200 F (i.e., if exceeded in Modes 1 - 4, enter TS 3.0.3 - Fix in 1 hour, else Mode 3 in next 6 hours and Mode 5 in next 30 hours)
3.6.1.1, Containment Integrity	$L_a < 0.6$ at P_a	Fix in 1 hour, else Mode 3 in next 6 hours and Mode 5 in next 30 hours



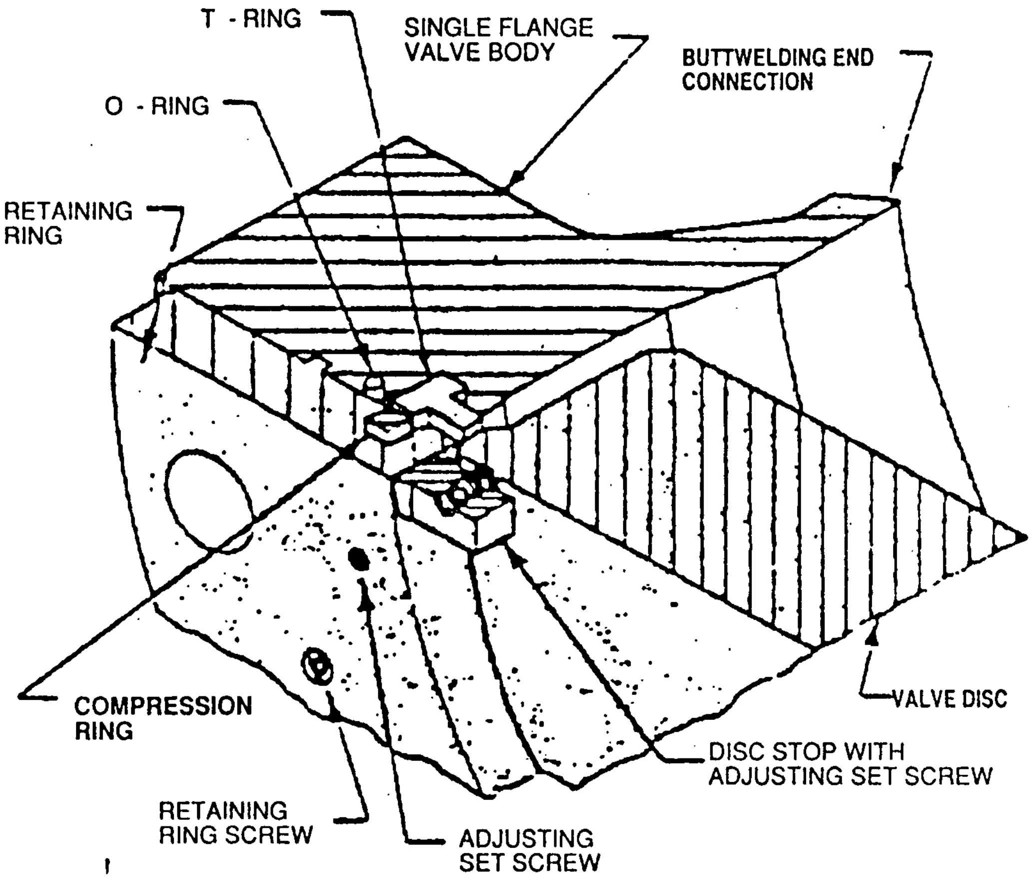
Containment Purge Exhaust Penetration

42" VALVES



42 INCH VALVE T-RING DETAILS

8" VALVES



8 INCH VALVE T-RING DETAILS

LLRT History Summary - Purge Supply and Exhaust Penetrations

- Prior to March 30, 1992, Only Sporadic LLRT failures
- Most Common Cause of LLRT Failures:
    - Valve stroke problems
    - T-Ring wear and adjustment problems
    - Particulates on valve sealing surfaces (mostly exhaust penetration)

BACKGROUND

PURGE EXHAUST PENETRATION 1992 LLRT HISTORY

3/30	Routine Quarterly LLRT Failed Entered Penetration to Adjust Outboard 42-inch Valve T-Ring
Apr/May	Vented Containment Through Exhaust Penetration Seven Times.
6/9	Routine LLRT Failed. Corrected by blowing particulates from mini-purge valve seats.

BACKGROUND

PURGE EXHAUST PENETRATION 1992 LLRT HISTORY - Continued

6/16-17	Performed special LLRTs on Penetration
	Performed as Found LLRT, With Virtually No Leakage.
	Vented Containment.
	Performed As-left LLRT.
	Leakage Exceeded 3 Times 0.05 L_a
	Blew Particulates From HV-9825 and HV-9824 Seats.
	Probable Cause of Valve Failure Determined To Be Particulates

BACKGROUND

PURGE EXHAUST PENETRATION 1992 LLRT HISTORY - Continued

7/2	Performed Pre-venting LLRT, With Virtually No Leakage Found. Containment Vented. Post-Venting LLRT Found Excessive Leakage. Blew Off Valve Seat of HV-9825 - LLRT Satisfactory. Postulated That Particulates Originated Within The Penetration And Not Within Containment.
7/10	7/2 Test Repeated At Reduced Pressure And Flow. Confirmed That Failures Caused By Particulates From Inside The Penetration.

BACKGROUND

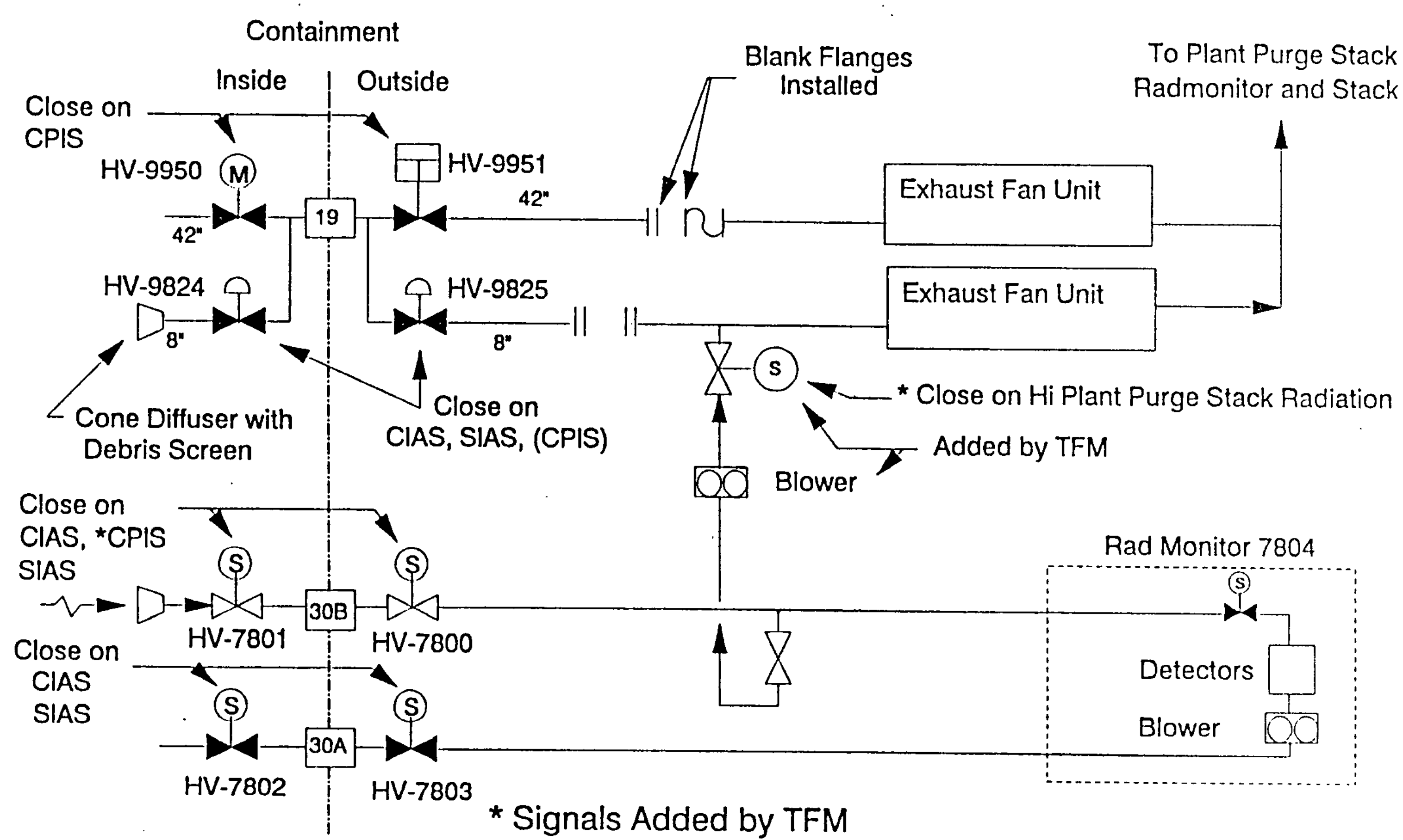
PURGE EXHAUST PENETRATION 1992 LLRT HISTORY - Continued

7/30-31	Implemented TFM To Bypass Purge Penetration In Order To Vent Containment For Pressure Control.
8/2	TFM Placed Into Service

TFM

PRA RESULTS

CASE#	SYSTEM	OPERATING TIME	SIGNIFICANT OFF-SITE RELEASE RISK
1	MINI-PURGE	4hrs/20days	7.6E-11/yr
2	MINI-PURGE	1000hrs/yr	1.0E-9/yr
3	MINI-PURGE	CONTINUOUS	9.0E-9/yr
4	TFM	4days/20days	1.0E-10/yr
5	TFM	CONTINUOUS	5E-10/yr

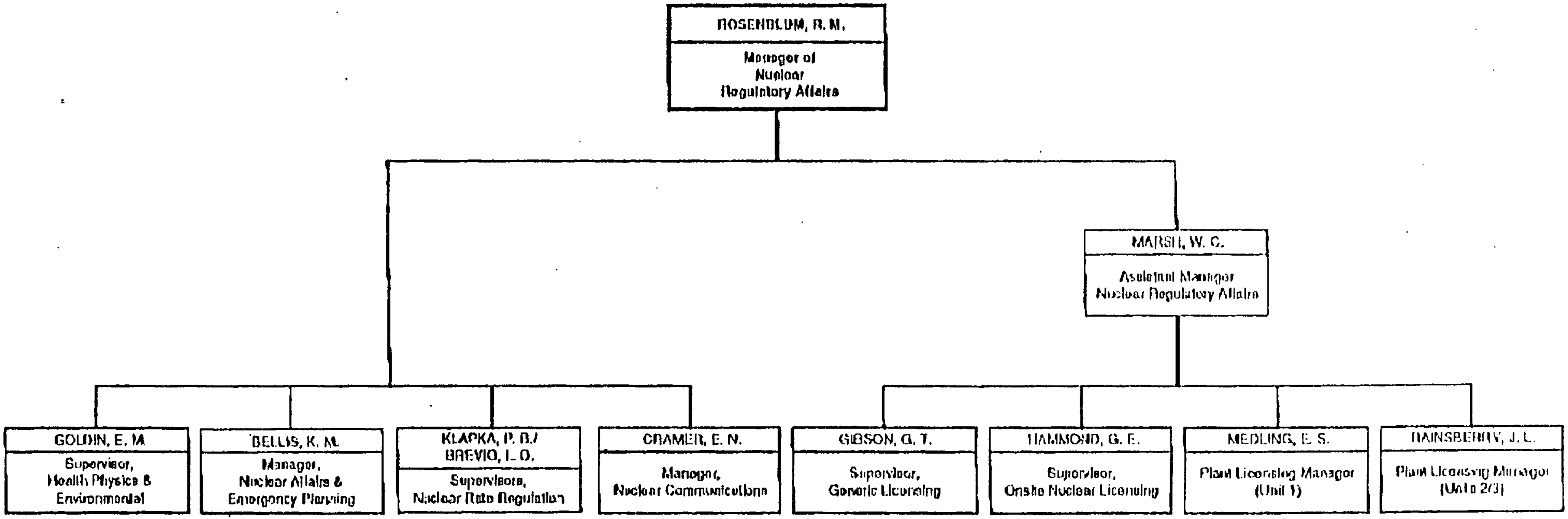


* Signals Added by TFM

( ) Signals Removed by TFM

Containment Venting After TFM Implementation

NUCLEAR REGULATORY AFFAIRS DIVISION

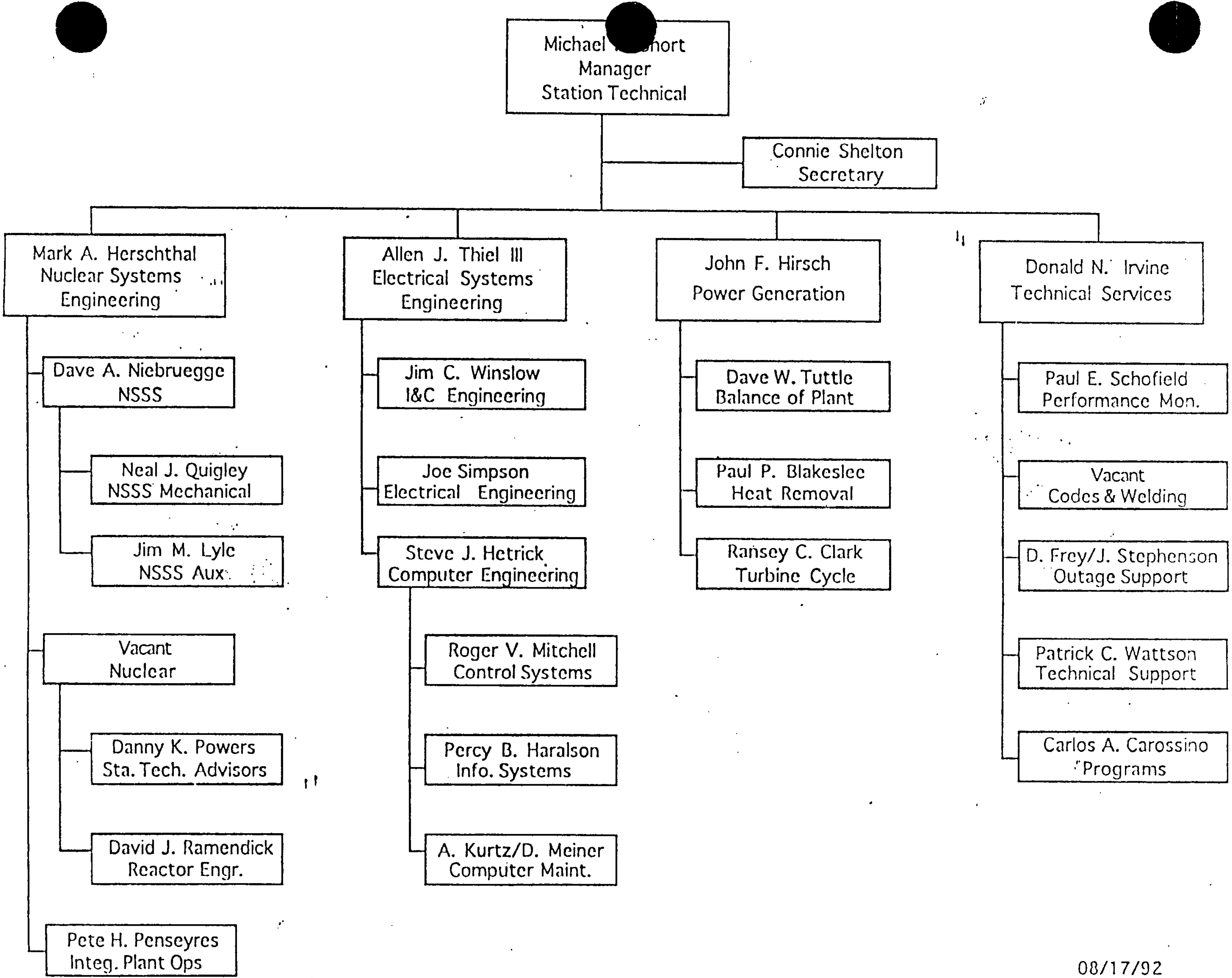


MISSION STATEMENT

The mission of Station Technical (STEC) is to provide expert engineering support in the day-to-day operation and maintenance of San Onofre Nuclear Generating Station (SONGS). This support ensures that plant systems, components, structures (hereafter termed "systems"), and programs achieve a level of performance meeting or exceeding those requirements in Technical Specifications, the FSAR, other rules and regulations, the approved design basis, and management goals.

Deviations from these requirements are identified in the day-to-day operation and maintenance of SONGS. STEC's mission is to assess the impact and determine the causes of these deviations. When necessary, STEC performs temporary or minor modifications to the systems and programs in support of SONGS day-to-day operations and maintenance.

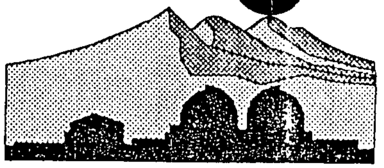
Many of the system and program requirements are not easily understood and usable by operations and maintenance. STEC's mission also includes interpreting the system and program requirements and providing usable guidance to support SONGS operations and maintenance.


Michael [illegible]hort
Manager
Station Technical
Connie Shelton
Secretary
Mark A. Herschthal
Nuclear Systems
Engineering
Dave A. Niebruegge
NSSS
Neal J. Quigley
NSSS Mechanical
Jim M. Lyle
NSSS Aux
Vacant
Nuclear
Danny K. Powers
Sta. Tech. Advisors
David J. Ramendick
Reactor Engr.
Pete H. Penseyres
Integ. Plant Ops
Allen J. Thiel III
Electrical Systems
Engineering
Jim C. Winslow
I&C Engineering
Joe Simpson
Electrical Engineering
Steve J. Hetrick
Computer Engineering
Roger V. Mitchell
Control Systems
Percy B. Haralson
Info. Systems
A. Kurtz/D. Meiner
Computer Maint.
John F. Hirsch
Power Generation
Dave W. Tuttle
Balance of Plant
Paul P. Blakeslee
Heat Removal
Ransey C. Clark
Turbine Cycle
Donald N. Irvine
Technical Services
Paul E. Schofield
Performance Mon.
Vacant
Codes & Welding
D. Frey/J. Stephenson
Outage Support
Patrick C. Wattson
Technical Support
Carlos A. Carossino
Programs

08/17/92

SOUTHERN CALIFORNIA EDISON

TECHNICA[illegible]IVISION
NUCLEAR SYSTEMS ENGINEERING



San Onofre Nuclear Generating Station

- **Mark A. Herschthal**, Manager, Nuclear Systems Engineering, 89301
  - Vacant, Secretary
  - **Dave Niebruegge**, NSSS Systems Supervisor, 86103
    - **Neal J. Quigley**, NSSS Mechanical, 86746
    - **Jim M. Lyle**, NSSS Auxiliary, 89425
  - Vacant, Reactor Engineering & STA Supervisor
    - **David J. Ramendick**, Reactor Engineering, 88704
    - **Danny K. Powers**, Sta. Tech. Advisors, 89155
      - UNIT 1
      - UNITS 2/3
  - **Pete H. Penseyres**, Integrated Plant Operations

Neal J. Quigley, NSSS Mechanical:

Bob Conoscenti	86807
Paul Leibowitz (5)	89074
Wayne Marsh	88701
Russ Nielsen	89214
Kieth Reeser	86138
Dwayne Roberts	89206
Jim Rudolph	89791
Joe Torres (1)	89493
Beatle Tran (1)	89493
Mike Vezzuto	86759

Jim M. Lyle, NSSS Auxiliary:

Joe Blake	89159
David Brenner	86696
Pete Bruno	86903
Sal Dolcemascolo (5)	89317
Kevin Flynn	89212
Dan Higgins	89211
John E. Hughes	87022
Dale Wickman	86152
Rick Zbavitel	89135

David J. Ramendick, Reactor Engineering:

Jay Iyer	RE 89156
Greg Keney	RE 88734
Bill Lilly (5)	RE 89096
Robert Margolis (5)	RE 88703
Aaron Smookler (1)	RE 89096
Rogelio Soto	RE 89592
Vacant (1)	

UNIT 1

Randall T. Benson	89802
Dean R. Goodwin	89129
Mark B. McKinley	89170
Steven E. Ross	86154
Kevin C. Wood	89316
Charlie Eischen (5)	86159

UNITS 2/3

John W. Ryder	86859
Robin I. Baker (6)	86790
Michael L. Barr (6)	86839
Gary L. Johnson Jr. (6)	89160
Calvin Meddings (6)	85153
John W. Perkins (6)	89178

Don Stearman 87305
Division Office Administrator

PAYROLL CLERKS
Rosie Razo (187) 89542
Sharon Anstaett (189) 88272

(1) Part Time
(2) Temporary
(3) Cross-training
(4) Leave Of Absence
(5) Contractor
(6) Sta Trainee
RE - Reactor Engineer

Approved MAHerschthal
Mark A. Herschthal

SDB 8/17/92

SOUTHERN CALIFORNIA EDISON

TECHNIC DIVISION
POWER GENERATION ENGINEERING


San Onofre Nuclear Generating Station

John Hirsch
Supervisor
Power Generation
86278

Jean Gomez
Secretary
89318

Vacant
Special Projects

Ransey Clark
Turbine Cycle
89169

Juan Armas	89233
Russ Chetwynd	89703
Danny Lowenberg	86755
Antonio Molina	89153
Mark Mountford (1)	89479
Dan Nougier	86742
Bernie Phillips	89381
Guy Shelton	89783

David Tuttle
Balance of Plant
86749

Aeri Daniels	86090
G. Gwiazowski (3)	89985
Henry Jones	89704
Ty Kent	86205
Al Ockert	89828
Judy Peck (1)	85170
Tom Peterson	89706
Bill Poirier	89198
Eric Schoonover (1)	85119
Del Smith	86743
Kevin Trout (1)	86289
Jorge Valdivia	86218
John Watkins	89829

Paul Blakeslee
Heat Removal
89215

Marco Ahumada	86360
Don Ashcraft	86210
Johnson Cheng	89793
Keith Chong	89017
Russ Cobb	86664
Bruce Friedberg (1)	86083
Bill Hines (1)	89362
Murray Jennex	86787
Jerome Marr	86041
Steve Roberts	89139

Don Stearman 87305
Division Office Administrator

PAYROLL CLERKS
Rosie Razo (187) 89542

(1) Part Time
(2) Temporary
(3) Cross-training
(4) Leave Of Absence
(5) Contractor
(*) Shift Technical Advisor

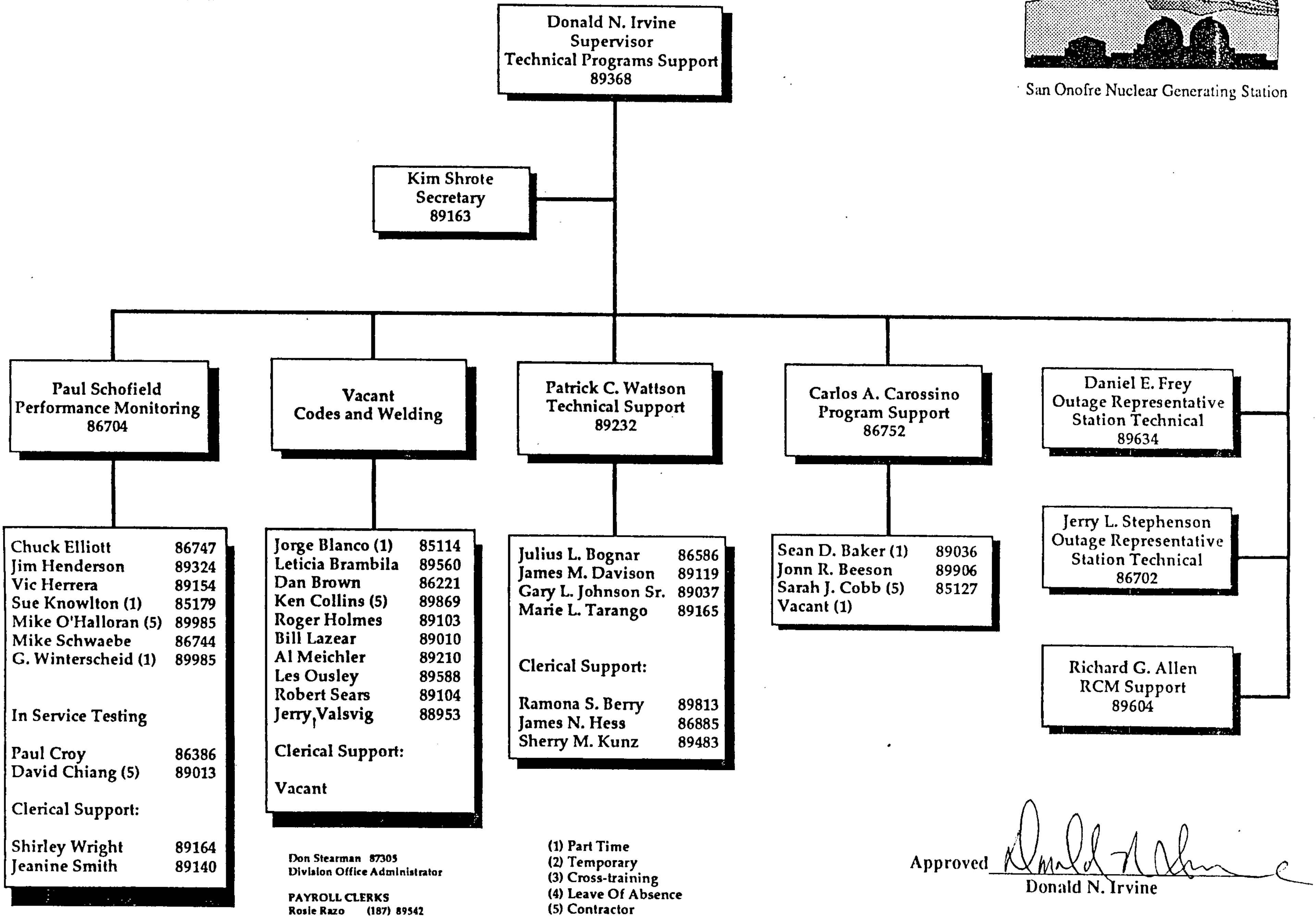
Approved
John Hirsch
8/17/92

SDB 8/17/92

SOUTHERN CALIFORNIA EDISON

TECHNICAL DIVISION
TECHNICAL PROGRAMS SUPPORT

San Onofre Nuclear Generating Station



Donald N. Irvine
Supervisor
Technical Programs Support
89368

Kim Shrote
Secretary
89163

Paul Schofield
Performance Monitoring
86704

Chuck Elliott	86747
Jim Henderson	89324
Vic Herrera	89154
Sue Knowlton (1)	85179
Mike O'Halloran (5)	89985
Mike Schwaebe	86744
G. Winterscheid (1)	89985

In Service Testing

Paul Croy	86386
David Chiang (5)	89013

Clerical Support:

Shirley Wright	89164
Jeanine Smith	89140

Vacant
Codes and Welding

Jorge Blanco (1)	85114
Leticia Brambila	89560
Dan Brown	86221
Ken Collins (5)	89869
Roger Holmes	89103
Bill Lazear	89010
Al Meichler	89210
Les Ousley	89588
Robert Sears	89104
Jerry Valsvig	88953

Clerical Support:

Vacant

Patrick C. Wattson
Technical Support
89232

Julius L. Bognar	86586
James M. Davison	89119
Gary L. Johnson Sr.	89037
Marie L. Tarango	89165

Clerical Support:

Ramona S. Berry	89813
James N. Hess	86885
Sherry M. Kunz	89483

Carlos A. Carossino
Program Support
86752

Sean D. Baker (1)	89036
Jonn R. Beeson	89906
Sarah J. Cobb (5)	85127
Vacant (1)	

Daniel E. Frey
Outage Representative
Station Technical
89634

Jerry L. Stephenson
Outage Representative
Station Technical
86702

Richard G. Allen
RCM Support
89604

Don Stearman 87305
Division Office Administrator

PAYROLL CLERKS

Rosie Razo	(187)	89542
Sharon Anstaett	(189)	88272

(1) Part Time
(2) Temporary
(3) Cross-training
(4) Leave Of Absence
(5) Contractor
(*) Shift Technical Advisor

Approved Donald N. Irvine
Donald N. Irvine

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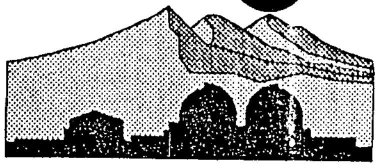
SOUTHERN CALIFORNIA EDISON

TECHNIC DIVISION
ELECTRICAL SYSTEMS ENGINEERING



San Onofre Nuclear Generating Station

Allen J. Thiel
Manager
Electrical Systems Engineering
87048

Vacant
Secretary

Jim Winslow
Instrumentation & Controls Engineering
86584

Bud Bostian	88724
Steve Foglio	89137
Don Frapwell	87411
Shreyas Gandhi (1)	89557
Chuck Hallett (5)	85125
Gerry Lear	86703
Russ Neal	89681
Mike Root (5)	86656
Lance Rushing (1)	85171

Vacant
Electrical Engineering

Paul Battish	89067
Bill Brush	89131
Tom Graham	89179
Susan Hower (1)	89342
Charles Kim (1)	89342
Larry Mueller (5)	89493
Ami Samanta	86705
Gary Segich	89072

Steve Hetrick
Computer Engineering
88730

Usoalii Afaese
Secretary
88720

Roger V. Mitchell
Control Systems
89801

Joe Aguirre	86345
Mike DePano (1)	85165
Gale Generoso (1)	85165
Ken Hooper	86994
Wayne Thomas	89665

Percy B. Haralson
Information Systems
88723

Steve Atkins	88415
Bob Boyer	89848
G. Castellanos	88719
Timothy Ford	88702
Chuck Kluz (1)	88721
Dave Knights	88728
Rory Job (1)	85165

Allen Kurtz	89833
Dan Meiner	86425

Computer Maintenance

J31

Cherie Leonard Cler/86526
Lowell Skinner Plan/86982

Operator PAX 86410
Tech PAX 87644

Lorraine Holmes	Oper
Debra Knights	Oper
Lani Majchrowicz	Oper
Mark Tomlinson	Oper
Frances Williamson	Oper
Paul Anderson	Tech
Mike Chandler	Tech
Ed Collins	Tech
Charles Hardin	Tech
Jeff Headlee	Tech
Larry Hodak	Tech
Tony Moreno	Tech
Mark Nowak	Tech
Steve Schultz	Tech
Bob Sorge	Tech

(1) Part Time
(2) Temporary
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(4) Leave Of Absence
(5) Contractor
(*) Shift Technical Advisor

Oper - Computer Operator
Tech - Computer Technician

Don Stearman 87305
Division Office Administrator

PAYROLL CLERKS
Rosie Razo (187) 89542
Sharon Anstaett (189) 88272

Approved AJThiel
Allen J. Thiel

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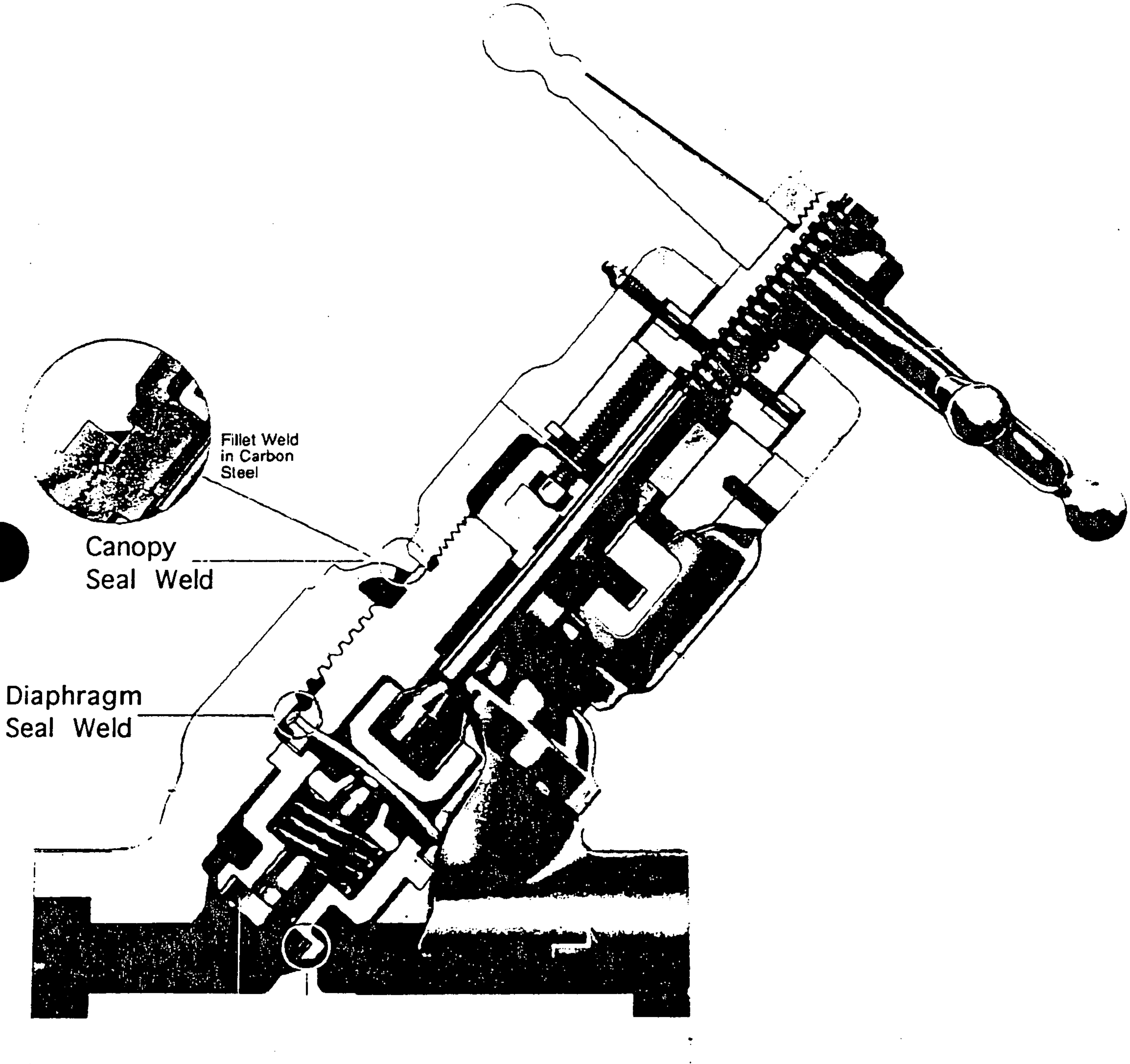
ROOT VALVE MR043



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