

**U. S. NUCLEAR REGULATORY COMMISSION**

**REGION V**

**SYSTEMATIC ASSESSMENT OF LICENSEE PERFORMANCE**

**INITIAL SALP BOARD REPORT**

**Nos. 50-206/92-28, 361/92-28, 362/92-28**

**SOUTHERN CALIFORNIA EDISON COMPANY**

**SAN ONOFRE NUCLEAR GENERATING STATION UNITS 1, 2 AND 3**

**AUGUST 1, 1991 THROUGH NOVEMBER 30, 1992**

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## I. INTRODUCTION

The Systematic Assessment of Licensee Performance (SALP) program is an integrated NRC staff effort to collect available observations and data on a periodic basis and to evaluate licensee performance on the basis of this information. The program is supplemental to the normal regulatory processes used to ensure compliance with NRC rules and regulations. It is intended to be sufficiently diagnostic to provide a rational basis for allocating NRC resources and to provide meaningful feedback to the licensee's management regarding the NRC's assessment of their facility's performance in each functional area.

An NRC SALP Board, composed of the staff members listed below, met on December 15, 1992 to review observations and data on performance, and to assess the licensee's performance pursuant to NRC Manual Chapter 0516, "Systematic Assessment of Licensee Performance," dated September 28, 1990.

This report is the NRC's assessment of the licensee's safety performance at SONGS for the period August 1, 1991 through November 30, 1992.

The SALP Board was composed of:

- \*K. Perkins, Director, Division of Reactor Safety and Projects, Region V
- \*R. Scarano, Director, Division of Radiation Safety and Safeguards, Region V
- \*M. Virgilio, Assistant Director for Regions IV and V Reactors, NRR
- F. Wenslawski, Deputy Director, Division of Radiation Safety and Safeguards, Region V
- \*L. Miller, Chief, Reactor Projects Branch, Region V
- J. Reese, Chief, Reactor Radiological Protection Branch, Region V
- R. Pate, Chief, Safeguards, Emergency Preparedness, and Non-Power Reactor Branch, Region V
- H. Wong, Chief, Reactor Projects Section II, Region V
- \*M. Fields, Project Manager, SONGS 2 & 3, Project Directorate V, NRR
- J. Bradfute, Project Manager, SONGS 1, Project Directorate V, NRR
- \*C. Caldwell, Senior Resident Inspector, SONGS
- T. Sundsmo, Project Inspector, Region V
- A. McQueen, Emergency Preparedness Analyst, Region V
- D. Schuster, Senior Physical Security Specialist, Region V

\*Denotes voting members in all functional areas. Other persons advised the Board in their areas of cognizance.

## II. SUMMARY OF RESULTS

### A. Overview

The licensee's performance during this SALP period continued to demonstrate a professional and responsible approach to operation of the

San Onofre Nuclear Generating Station. As a result of improved operator monitoring of plant conditions, the number of significant events attributed to causes under operations control decreased. In addition, operator response to plant events demonstrated the operators' ability to handle plant challenges. This resulted in Unit 3 having a long successful run, and Unit 1 setting a site record for continuous operation which exceeded one year. As a result of Operations continued improved performance from the previous SALP period, the SALP Board concluded that a Category 1 rating was appropriate. The rating during the last SALP period was a Category 2, with an improving trend. Continued management attention to further improve the Operations Department interface with other organizations, attention to detail to reduce operator errors, and planning and procedure enhancements is essential to sustain a high level of performance.

Continued superior performance was observed in three areas (Radiological Controls, Emergency Preparedness, and Security) which were again rated Category 1.

In the Maintenance/Surveillance area, the SALP Board concluded that licensee performance remained a Category 2. The Board noted some improvement in this area in the last half of the assessment period, but did not consider the improvement to be sustained for sufficient time or at a sufficient rate to warrant an "improving trend" in this assessment period. The licensee's surveillance testing program failed in some instances to identify degrading plant equipment, significant maintenance related errors continued, and weaknesses in the measuring and test equipment program were identified. Management should continue with the implementation of initiatives such as the Partners For Success program, with periodic assessments of their effectiveness.

In the Engineering/Technical Support area, a weakness was identified in some cases wherein licensee engineers and management displayed a tendency towards apparently expedient rather than thorough resolution of emerging issues. In the last SALP period, weaknesses were evident in the areas of timely evaluation and resolution of emergent issues. In this SALP period, similar weaknesses were observed, involving either a tendency toward expediency, or in underestimating the scope and complexity of the problem. Management should emphasize the need to resist this tendency. Additionally, improvement in the interface between engineering and other organizations, and assessment of the responsibilities of system engineers is encouraged.

The Safety Assessment/Quality Verification (SA/QV) area continued to improve in certain aspects during this assessment period. The SALP Board concluded that a Category 2 rating, with an improving trend, was appropriate recognizing the Nuclear Oversight Division's superior performance in assessing plant performance. However, certain weaknesses in management effectiveness are reflected in the SA/QV area and need further attention. In particular, SCE management's assessment of emerging issues were in some cases too narrowly focused or communications with the NRC on these issues were not effective. In

addition, corrective action followup was not always thorough or timely, and inaccuracies were evident in some submittals to the NRC. Management should pursue more aggressive corrective action followup and provide emphasis on accuracy of submittals to the NRC. In addition, more effective management involvement in assessment and resolution of emerging issues is recommended.

#### B. Results of Board Assessment

Overall, the SALP Board found the performance of NRC licensed activities by the licensee to be good and directed toward safe operation of the SONGS facility. The SALP Board made specific recommendations in most functional areas for licensee management consideration. The results of the SALP Board's assessment of the licensee's performance in each functional area, including the previous assessments, are as follows:

	<u>Functional Area</u>	<u>Rating Last Period</u>	<u>Rating This Period</u>	<u>Trend*</u>	
A.	Plant Operations	2	Improving	1	
B.	Radiological Controls	1		1	
C.	Maintenance/Surveillance	2		2	
D.	Emergency Preparedness	1		1	
E.	Security	1		1	
F.	Engineering/Technical Support	2	Improving	2	
G.	Safety Assessment/ Quality Verification	2	Improving	2	Improving

\* The SALP report may include an appraisal of the performance trend in a functional area for use as a predictive indicator. Licensee performance during the latter portion of the assessment period was examined by the SALP Board to determine whether a trend exists. Normally, a performance trend will be indicated only if (1) a definite trend is discernible and (2) continuation of the trend could result in a change in performance rating. The performance trend is intended to predict licensee performance during the next assessment period and should be helpful in allocating NRC resources.

#### C. Changes in SALP Ratings

One change in SALP ratings was in the area of Plant Operations, in which the licensee demonstrated superior performance. The number of significant events attributed to causes under Operations control decreased from the previous SALP period. When reactor trips did occur, operators successfully diagnosed and responded to them.

### III. PERFORMANCE ANALYSIS

The following is the SALP Board's assessment of the licensee's

performance in each of the functional areas, along with the Board's conclusions and recommendations regarding licensee actions and management emphasis.

A. Plant Operations

1. Analysis

Eleven routine resident inspections were conducted during this SALP period. Review of Operations activities during these inspections accounted for approximately 37 percent of the total San Onofre (SONGS) inspection effort.

The NRC rated the licensee's Operational performance in the last SALP cycle as Category 2, improving. The SALP Board recommendations were for continued management support of the Operations staff to promote close monitoring of plant conditions, and management attention to proper application of Technical Specification (TS) requirements. The Board also recommended that the licensee continue to enhance operator development and training programs, and the quality of operating procedures.

The performance in this area continued to improve from the previous assessment period and demonstrated superior performance. Strengths identified were operator response to events, improvements related to the previous Board recommendations, and the fire protection program. Weaknesses identified were occasional examples of: inattention to detail, incompleteness of operational surveillances, and poor interface between Operations and other organizations.

Operator monitoring of plant conditions improved as a result of recommendations initiated in part by the licensee's Work Authorization Task Force. This was achieved by moving work to support maintenance out of the control room. As a result, operators were provided more time to monitor plant conditions. In addition, the high operator attrition of the previous SALP period has been effectively terminated.

The number of significant events attributed to causes under Operations control decreased from the previous SALP period. As a result, Unit 3 had a long successful run, and Unit 1 set a site record for continuous operation, exceeding one year. Additionally, when challenged by events, operators responded promptly and correctly. For example, operators manually initiated emergency feedwater and a rapid power reduction after loss of a main feedwater pump, thereby averting a reactor trip. When reactor trips did occur, operators successfully diagnosed and responded to them. The four automatic trips that occurred in the three units this period resulted from three separate equipment failures and a Maintenance personnel error.

Some minor operational errors occurred during the Unit 3 Cycle VI outage and were largely attributed to insufficient attention to detail or to the performance of evolutions without adequate consideration and planning. Examples were an inadvertent de-energization of an Engineered Safety Feature Actuation System power supply which caused a fast start of a diesel generator, and the initiation of core alterations without the audible neutron count rate instrument in containment operable. However, operators adequately responded to these events and others before they became significant. An example was the case of a spent fuel pool drain down event, caused by an inadequate system alignment, in which control room operators promptly recognized, diagnosed, and terminated the drain down before reaching the pool low level limit.

Improvement in operator training contributed to a reduction in operator errors, although continued effort in this area is needed. The passing rate of the requalification examinations for Units 2 and 3 was 100 percent for eight individuals and three crews. This reflected encouraging performance. The Unit 1 initial license examination showed a decline in performance from past examinations. In this examination, six of twenty-one candidates failed, which indicated inadequate preparation by Training. Subsequently, five of the candidates retook the examination and passed. The SALP Board noted that there were some unique conditions since this was the final examination prior to the permanent shutdown of Unit 1.

The licensee effectively utilized feedback tools such as Operations Division Event Reports (ODERs) to assess weaknesses and implement improvements where necessary. Based on a quarterly assessment of ODERs, the licensee identified the need for additional training on attention to detail in operations outside the control room. To further improve operator performance, Operations management initiated actions to place an additional licensed senior reactor operator on every shift to provide additional supervision outside the control room, and to support the work process.

Operations interface with other organizations was identified to be a weakness on several occasions near the end of the period. For example, during the performance of thermographic testing of reactor coolant pump switchgear, maintenance and engineering personnel caused a reactor trip due in part to inadequate oversight by Operations. In addition, following a saltwater cooling valve inservice test, the seal water supply valve was not positioned properly using an engineering procedure. The licensee recognized the need for improvement in this area and initiated corrective actions at the end of the period.

Toward the end of the assessment period, Operations management established a formal program to define management expectations

with respect to good operating practices. The program provided for formalized training, monitoring, evaluation, and feedback of good operating practices. The intent was to further enhance operator performance. In addition, in response to events that were related to programmatic deficiencies during the previous period, Operations management initiated efforts to upgrade operating procedures. However, the effectiveness of these efforts was not observed in this period.

2. Performance Rating

Performance Assessment - Category 1.

3. Board Recommendations

The Board recommends continued management attention to further improve the interface with other organizations, attention to detail to reduce operator errors, and planning and procedure enhancements in order to maintain the Category 1 rating. Effective communication of management expectations and follow through on their effectiveness is encouraged.

B. Radiological Controls

1. Analysis

Nine region-based inspections of the licensee's chemistry and radiation protection programs were conducted during this SALP period. One inspection was a team inspection of the licensee's chemistry program, including their radiological, non-radiological chemistry programs, and their erosion and corrosion inspection programs. The regional review of chemistry and radiation protection programs accounted for approximately seven percent of the total SONGS inspection effort.

The NRC rated the licensee's chemistry and radiation protection programs performance in the last SALP cycle as Category 1. Strengths were noted in management attention to programs, training of staff, and the planning and conduct to radiological work operations. The Board recommended that the licensee continue to provide support to site and corporate staff initiatives aimed at improving the performance level of the chemistry and radiation protection programs. Also, the Board recommended that emphasis should be directed toward ensuring that facility upgrades are carried out and contract personnel fully benefit from the licensee's formal training programs. Further, the Board recommended that the licensee should be particularly sensitive to performance in those areas in which management positions within the Health Physics Department have been filled with individuals who do not have a strong health physics background.

These recommendations and others were addressed by the licensee



during this period. The performance of the chemistry and radiation protection staffs, and of the radiological workers remained the same (except for one notable occurrence during the Unit 3 Cycle 6 outage). The licensee continued building the South Yard radioactive material storage and processing facility. The number of chemistry and radiation protection related events remained low with no events being significant. Training of staff personnel, especially in the area of chemistry activities, showed improvement. Adequate staffing remains a strong factor in the licensee's performance in the radiation protection area. Toward the end of the SALP period the licensee had significantly reduced the use of contractors in radiation protection positions without any apparent reduction in performance. The licensee did not routinely use contracted personnel in the operational portions of the chemistry program.

The licensee's total personnel radiation exposure expenditure for the site of 411 person-rem (137 person-rem per unit) was significantly below their goal of 680 person-rem for 1991. The licensee's ALARA program is well staffed and proactive in its activities. There is consistent evidence of prior planning and assignment of priorities as evidenced by special projects planning, such as, the reactor coolant pump hydrostatic bearing inspection. The radiation "Hot Spot" trending and removal program appears to be effective, as is the engineered shielding program.

The licensee's Chemistry Department continues to perform well. Most notable were the development of procedures, facilities (including training), and the secondary plant chemistry and erosion/corrosion programs. The licensee had a carefully planned and well developed erosion/corrosion program which met the requirements of Generic Letter 89-08. A comprehensive NRC Chemistry team inspection of the licensee's radiological and non-radiological programs during this appraisal period identified several noteworthy program attributes. The licensee's radiochemistry program performance in the confirmatory measurement portion of the inspection was very good. The condensate/feedwater pH optimization study, steam generator hideout return studies, and use of the Secondary Chemistry Corrosion Index exemplified management's commitment to water chemistry control.

The licensee achieved improvements in the areas of personnel dosimetry by implementation of state of the art digital readout and alarming dosimeters to replace the self reading pocket ion chamber (PD/SRD/PIC). The licensee installed new high sensitivity personnel monitors during this period.

The licensee continues to implement a good quality assessment and quality assurance programs that comprehensively probe the licensee's chemistry and radiation protection operations. Quality assurance and control continued to be implemented in a satisfactory manner. Audits and assessments were of proper depth

and breath. Findings were normally resolved in a timely manner.

The licensee's approach to identification and resolution of technical problems was very effective. The licensee routinely utilizes the Independent Safety Evaluation Group, other disciplines, or in-house root cause analyses for identifying the underlying problems. This was most notable in the licensee's review of whole body and extremity dosimetry issues raised during a review of the dosimetry program. Also, the licensee's investigation and technical resolution to the iodine uptakes by over 30 workers during a Unit 1 outage in October 1991 was very detailed and thorough. Identification of uptake pathways via skin absorption during the use of decontamination solutions was an example. The licensee's corrective actions for this problem were expedient and comprehensive. Actions were developed and effectively implemented for an outage in Unit 1 the following month. The licensee streamlined the process of installing temporary lead shielding so that extensive and time consuming engineering work-ups for typical shielding packages were eliminated.

The number of enforcement actions were similar to the last appraisal period and were comprised of non-repetitive, less significant findings (severity level and less NRC-identified findings) than the previous inspection period. Only two cited and five non-cited violations were identified by the NRC inspection staff during this appraisal period. Only two areas, radioactive material labeling and missed chemistry surveillances had indications of becoming areas of concern and the licensee quickly performed corrective actions to bring these areas back into compliance. Corrective actions were effective as indicated by the lack of repetition of events and enforcement.

Staffing in both the HP (including the corporate HP Group) and Chemistry departments continues to be a positive factor in the licensee's level of performance in these areas. Personnel changes and reassignments, while not infrequent, prevented stagnation and are for the most part well received by the staff. Recent reductions in contract personnel use have been judiciously applied and do not appear to be weakening the licensee performance. The Chemistry Department staffing is steady, but may change with the decommissioning of Unit 1.

2. Performance Rating

Performance Assessment - Category 1.

3. Board Recommendations

None.

## C. Maintenance/Surveillance

### 1. Analysis

In addition to routine resident inspections, five Region V inspections, and one NRC headquarters inspection were conducted in the maintenance area during this SALP period. Review of this functional area accounted for approximately 21 percent of the total SONGS inspection effort.

At the end of the previous SALP period, the SALP Board rated the licensee's performance as Category 2 in this functional area. The Board recommended that the licensee continue initiatives such as the Work Authorization Task Force (WATF) and the Reliability Centered Maintenance (RCM) program. The Board recommended that more attention be focused on the reduction of personnel errors and reducing scheduled maintenance impact on safety. Enhancements to the post-maintenance testing (PMT) program, work control process, quality of maintenance procedures, and training program were also recommended.

In general, performance in this area remained a Category 2 during this assessment period. The Board noted some improvement in this area, particularly during the last half of the period, but did not consider the improvement sustained for sufficient time or at a sufficient rate to warrant designating a trend for this assessment period. The major strength during this period was viewed to be the licensee's aggressiveness in addressing previous Board recommendations. This was accomplished by implementation of new programs designed to reduce errors, enhancements to procedures, improvement to work control and planning processes, more detailed training, and more critical self-assessments. In addition, PMT was more effectively implemented, and containment leak rate testing was also considered a strength. Some maintenance and surveillance activities adversely impacted operations, although the number of errors decreased significantly from the previous assessment period. Weaknesses were observed with missed or inadequate surveillances and inadequate implementation of the measuring and test equipment (M&TE) program.

The licensee focused considerable effort on enhancements to previously identified weaknesses in the maintenance process. In addition to continued activities in RCM, the licensee initiated a number of new programs such as "Partners for Success," intended to enhance the interface among craft, planners, and supervisors. This program was fully implemented in Unit 1 and contributed to a reduction in rework, more effective maintenance orders, and less personnel errors. The licensee was still in the process of implementing this program in Units 2 and 3 at the end of the assessment period. Other initiatives, such as the "STOP" and "AWARE" programs, implemented late in the period, were intended to further enhance Maintenance effectiveness by providing better

guidance for tailboards and turnovers.

The licensee expended considerable resources to enhance procedures this assessment period. Procedures in general were more detailed and provided better information to the craft. The licensee expects to complete this effort early in 1993. Recommendations for enhancements to the work control process by the WATF included the establishment of a work authorization coordinator and a work window manager, both of which contributed to an improved interface with operations on specific work activities.

The licensee performed more training this assessment period for maintenance personnel in such areas as basic plant systems, process controls, and human effectiveness. In addition, a training program for maintenance planners was initiated near the end of the period.

As the SALP period progressed, the licensee was observed to be more self-critical in dealing with maintenance related problems. Early in the assessment period, the valve bonnet for Unit 1 safety injection related valve HV-852B was dropped. The event was downplayed by the responsible Maintenance foreman, which set a poor example to the craft with regard to handling problems when encountered. The licensee management implemented a supervisory training program to minimize the potential for similar events, and by the end of the period, root cause investigations were routinely implemented and were more critical of performance. The licensee also was aggressive in reducing the number of backlog maintenance items.

In general, maintenance and surveillance activities were conducted more effectively and were better documented than in the past. For example, the licensee's efforts to repair cracks on Unit 3 pressurizer instrument nozzles and the licensee's containment integrated leak rate test program were implemented effectively. In addition, post-maintenance testing was more effective this period. Problems that did occur during the period were most often associated with personnel errors due to inattention to detail, inadequate documentation to support the activity, or poor interface and communication. These weaknesses resulted in a few events, such as a shutdown of Unit 1 due to excessive air leakage from a pressurizer power operated relief block valve and a reactor trip of Unit 2 while performing thermography of reactor coolant pump switchgear.

While the licensee satisfactorily completed a large number of surveillances, personnel errors resulted in delinquent surveillances of such components as reactor coolant pump flywheels in Units 1 and 3, and vital batteries in Unit 3. In addition, weaknesses in or lack of surveillances resulted in the inability to detect accumulation of moisture in the steam lines to the Unit 2 turbine driven auxiliary feedwater pump, accumulator piston

misalignment of Unit 1 safety injection valve HV-852B, and inoperability of the Unit 1 4160 VAC switchgear room Halon system (due to inadequate maintenance in 1988). The inoperable Halon system, combined with an inadequate assessment of the condition, resulted in escalated enforcement action this assessment period.

Numerous weaknesses in the licensee's M&TE program were observed during the SALP period by a licensee Quality Assurance audit and by the NRC. In particular, the accuracy of some M&TE was questionable and the program, as designed, could result in equipment being out of calibration for long periods of time. In addition, some calibration failure evaluations were inadequate and documentation of M&TE usage was not correctly performed approximately 22% of the time. The latter weakness resulted in a number of calibration failures not being evaluated for impact on plant equipment. An extensive effort by the licensee verified that no significant safety issues existed due to the failed calibrations, although documentation of some of the assessments supporting that conclusion was found to be weak.

One instance regarding the negative impact of scheduled maintenance on safety was observed. It involved a Unit 3 high pressure safety injection (HPSI) pump which was out of service for troubleshooting and repair for more than six weeks. Although licensee management considered that the spare pump was installed for operational flexibility, a probabilistic risk assessment performed for work on a Unit 2 HPSI pump of a similar duration determined that this resulted in an approximate 10% increase in core damage probability.

One escalated enforcement action was taken in this area, a Severity Level III violation in which a continuous fire watch was not established when both banks of the Halon system for the 4160 volt switchgear room were inoperable due to maintenance errors in 1988.

## 2. Performance Rating

Performance Assessment - Category 2.

## 3. Board Recommendations

Some improvement was recognized in this area, particularly in the last half of the assessment period, but it was not of sufficient duration or rate to be designated a trend. The Board recommends that SCE management continue with implementation of initiatives such as the Partners For Success program and make periodic assessments of their effectiveness. In addition, effective implementation of detailed surveillances to identify degrading and inoperable equipment is recommended. Strengthening of the M&TE program and continued sensitivity to the impact of maintenance on safety is encouraged.

## D. Emergency Preparedness

### 1. Analysis

Two routine emergency preparedness (EP) inspections and two EP annual exercise team inspections were conducted during this assessment period. Review of the EP program accounted for approximately six percent of the SONGS inspection effort.

The licensee's EP performance in the last SALP cycle was rated as Category 1. The SALP Board recommended that management provide continuing attention to improving the effectiveness of emergency response staff training and maintain its support of the EP corrective action and offsite programs. The Board also recommended that the licensee continue efforts to improve public address (PA) system performance. Also in the last SALP report, a concern was identified about the effectiveness of the retraining of the emergency response staff.

Strengths identified during the current assessment were in the areas of EP staffing, training, and conscientious attitudes toward accomplishing established goals. A weakness was noted in the area of health physics emergency response activities during annual emergency exercises. Generally, licensee performance in the emergency preparedness area appears to be consistent with its past performance record.

Licensee management was actively involved in EP activities and demonstrated support by providing the necessary resources to the EP staff. Management apparently took particular interest in correcting problems and responding to NRC findings indicating need for corrective action. During the assessment period, the licensee worked closely with the state, local county governments and FEMA in resolving issues in offsite preparedness planning.

Licensee management's approach to the resolution of technical issues was generally timely and appeared to be thorough, with one exception. In one instance, the NRC expressed concern about the timeliness of the licensee's corrective actions to establish an adequate capability for monitoring/decontaminating personnel (and vehicles) evacuated from the site. The licensee expedited corrective actions in response to the NRC concern.

During the SALP assessment period, one EP exercise weakness and a non-cited violation (NCV) involving a late report to the NRC were identified. Otherwise, there were no enforcement actions taken in the EP area. The exercise weakness involved the health physics response during the 1991 annual exercise. Most elements of the weakness were specifically addressed in the 1992 exercise, although there were some common shortcomings in both exercises which indicated a need to improve health physics planning for in-plant response teams. Otherwise, performance in the 1992 exercise

indicated improvement over the 1991 exercise.

The licensee reported three unusual events to the NRC during the assessment period. The events, involving two earthquakes and one Technical Specification (TS) required shutdown, were properly identified and analyzed in accordance with Emergency Plan and Emergency Action Level (EAL) requirements. Notifications to the NRC and offsite agencies were likewise in accordance with regulatory requirements.

As indicated above, EP staffing was identified as a strength. Personnel losses during the assessment period prompted re-adjustment and realignment of functions and responsibilities, which appeared to have been accomplished effectively and with no notable impact on the program. No significant changes occurred to the composition of the emergency response organization (ERO) during the assessment period, and the licensee's systematic method to ensure that new ERO personnel were properly trained prior to assignment continued to be effective. EP staff and emergency response positions were clearly identified, authorities and responsibilities appeared clearly defined and key positions were filled as appropriate. Decision making authority appeared properly delegated to insure quick identification of and response to problems and changes. Emergency facilities continued to be appropriately maintained and ready for rapid activation. The licensee continued to provide adequate levels of dedicated staff to implement the programs and to interact appropriately with offsite agencies.

The licensee's efforts during the assessment period to improve the emergency preparedness training program were considered a strength. The licensee has an effective system to ensure that required training is conducted and that training due dates are not exceeded, by tying accomplishment of EP training requirements to unescorted access privileges. To supplement and reinforce routine annual training, a program of quarterly integrated drills, mini-drills, and tabletop training sessions were conducted.

2. Conclusion

Performance Assessment - Category 1.

3. Board Recommendations

The licensee should focus management attention in improving health physics planning for in-plant response teams during emergencies to prevent recurrence of the type of shortcomings observed in the last two emergency exercises.

## **E. Security**

### **1. Analysis**

Three routine physical security inspections and one Operational Safeguards Response Evaluation (OSRE) were conducted during this inspection period. Review of security activities during these inspections accounted for approximately three percent of the total SONGS inspection effort.

The NRC rated the licensee's Security performance in the last SALP cycle as Category 1. Strengths were observed in Management involvement in assuring quality, security staffing, security training and qualification program. Several proactive security upgrades were also identified.

Generally, in this area the licensee continued to be proactive and innovative in their approach to maintaining and enhancing security. In most areas the licensee was found to exceed minimum requirements. One weakness was identified and corrected as a result of increases in the number of security events.

During this period several licensee initiatives to upgrade security areas were completed. These upgrades were: Protected Area (PA) barriers; Organization/Responder Post Enhancements; and Target Analysis. The licensee continues to make significant progress for a series of additional enhancements in the areas of: tactics; training; weapons/uniforms and equipment; computer systems; and personnel access. These upgrades to security exceed minimum security practices and requirements.

The security organization has a program to cross-train in other licensee organizations. These include assignments in: security training; refueling group; operations; corporate quality assurance group; and emergency preparedness. These assignments afford those security officers an insight into other divisions perceptions of security and an appreciation of the other group's trials and tribulations. As a result of this cross-fertilization, improved communications have resulted.

A security Training Compound was opened during this period. It was observed that this compound affords security responders the opportunity to practice actual tactical response related activities in simulated plant environs, fire blank ammunition, employ the MILES Integrated Laser Engagement System, and to fire paint pellets from handguns during shoot-don't-shoot exercises. It was also determined that a significant increase in performance based refresher training has occurred for security officers.

Enforcement action was limited to one non-cited violation pertaining to a failure to test security equipment. Had the licensee not taken prompt corrective action, this deficiency could



have led to unauthorized access to a vital area.

The licensee performance with respect to security events was mixed in effectiveness. The licensee submitted copies of the safeguards event log on a quarterly basis as required. During the beginning of this SALP period there was a significant increase (181 events versus 114 the previous quarter) in the number of events indicating a declining trend in the security program and warranting additional management attention. The increase in events was attributed to human errors (102 events) as a result of a substantial increase in the number of personnel authorized during a refueling outage. By the end of the SALP period, it was determined that licensee management had taken a series of actions which resulted in a significant reduction of security events. Examples of actions taken were: one-on-one briefings with the responsible individual; one-on-one briefings with the individual's first line supervisor; updated monthly news magazine articles and briefings to organizations on the problems associated with the violations. As a result of these actions security events for the last quarter of the SALP were reduced to 86 events, of which 41 were caused by human error.

The experience and effectiveness of the licensee's security staff supporting the overall security program was considered a strength. Key positions were identified and responsibilities are well defined. Some shifting of resource have occurred, reducing overhead positions and increasing armed responders.

An OSRE was conducted by NRC personnel assisted by members of the U.S. Army Special forces. One objective of the OSRE is to evaluate the licensee's abilities to respond to an external threat by focusing on the interactions between operations and security in establishing priorities for protection of equipment and on the defensive strategies used.

Based on the high quality of drills, exercises, and demonstrations observed by the team and the results of interviews, the team concluded that SONGS had an excellent contingency response capability. In addition, effective provisions were in place to assure that safeguards measures did not adversely affect the safe operation of the facility. The licensee's success were attributed to: strong management support involving senior management, e.g., actual involvement in drills and providing necessary funding; major improvements in tactical responses; and training of a four person adversary team that truly tests the licensee response capabilities.

## 2. Performance Rating

Performance Assessment - Category 1.

### 3. Board Recommendations

Licensee management should continue to monitor the trend of the security events.

## F. Engineering/Technical Support

### 1. Analysis

In addition to routine resident inspections, nine engineering inspections, and one NRC headquarters inspection were conducted in this functional area during this SALP period. Review of Engineering/Technical Support activities during these inspections accounted for approximately seven percent of the total inspection effort.

Licensee performance in this functional area during the previous SALP period was rated Category 2, with an improving trend. The SALP Board recommended that the licensee continue improvements in support of engineering programs, continue development of the setpoint methodology program, ensure proper calculational assumptions, strengthen the effectiveness of engineering and technical work on emergent issues, and strengthen technical reviews.

During the current period, several improvements were noted in this area, but performance was inconsistent. The licensee successfully implemented Board recommendations with respect to the enhancement of engineering programs and setpoint methodology. Improvement in engineering design changes and training programs was also noted. Strengths were observed in the licensee's in-house analytical capabilities, supporting such topics as the erosion/corrosion program. Weaknesses continued in the areas of timely evaluation and resolution of emergent issues and inadequate independent verification. In addition, weaknesses in the non-destructive examination (NDE) program, inservice testing (IST) program, procurement program, and a weak interface between Station Technical and Operations were observed during this period.

The licensee showed aggressiveness toward improving engineering programs and activities. For example, the licensee issued their formal Instrument Setpoint Calculation Program document, which included an instrument calculation design standard to provide specific guidance for performing instrument calculations. In addition, the licensee initiated efforts to establish engineering design standards aimed at improving the quality and consistency of design documents.

Several design change packages, reviewed during this period, showed an improved quality of engineering work. Examples included an Anticipated Transient Without Scram design change for Units 2 and 3, and a Temporary Field Modification (TFM) to the Unit 2

containment mini-purge system.

Engineering training was enhanced by the initiation of several new programs and policies. Examples included the development of a system engineer qualification guide, and the establishment of a document which formally promulgated the roles and responsibilities of Station Technical personnel. These were initiated in order to achieve a consistent level of performance among engineering staff. In addition, the licensee developed guidance for the selection of supervisory personnel and initiated an assessment to identify training needs for current first-line supervisors.

With respect to the licensee's engineering analytical capability, an NRC Chemistry team inspection reviewed the licensee's erosion/corrosion program and found it to be well developed. In addition, detailed analyses of the plant, such as a design basis reconstitution, identified several significant problems including a potential environmental hazard to several auxiliary feedwater valves in Units 2 and 3.

As discussed in the previous SALP report, engineering and technical activities associated with shorter term or emergent issues did not always result in satisfactory resolution the first time. During this period, some instances of similar weaknesses were observed, involving either a tendency toward apparent expediency, or in underestimating the scope and complexity of the problem. This tendency towards addressing issues in a less than thorough manner caused extended discussions with the NRC to resolve the issues. Examples included a technical evaluation of leakage from the Unit 1 feedwater/safety injection valve actuators that did not sufficiently characterize the significance of the leakage (due to insufficient knowledge), the initial assessment of Unit 1 refueling water storage tank leakage which did not fully characterize the corrosion mechanism or the possible extent of the corrosion, and an assessment of vital battery cracking that did not adequately baseline existing flaws.

Weaknesses in the interface between the Station Technical and Operations divisions contributed to several events this period. For example, a deficient engineering procedure that directed operator actions contributed to the misalignment of a Unit 2 salt water cooling pump seal supply valve, and a Unit 2 trip resulted from deficiencies in communication during thermography work.

An area of continuing concern was observed with independent verification of engineering work. For example, the Motor Operated Valve (MOV) inspection team identified that the independent verification of MOV design setpoint calculations was not effective in identifying numerous errors. Another example involved an environmental qualification evaluation for a TFM to the Unit 2 safety injection system in which neither the initial assessment nor subsequent reviews identified a potential chemical spray

hazard to safety-related equipment.

The NRC mobile non-destructive examination (NDE) laboratory performed an inspection of the licensee's NDE program. The examination found that revision 5 to the Inservice Inspection Program was issued without the required approvals, final radiographs for a number of American Society of Mechanical Engineers (ASME) Code Class 2 welds were not retrievable, and management oversight was inadequate to ensure the proper levels of program control.

Early in the period, IST inspections conducted by Region V revealed weaknesses with maintenance and surveillance areas of the IST program. Weaknesses included the lack of valve stroke time trending for failed surveillance tests and difficulties in detecting valve degradation. In addition, discrepancies between field recorded data and surveillance instructions were observed. The licensee detected numerous check valves that should have been included in the reverse flow surveillance testing program. These deficiencies were promptly corrected when found.

An NRC inspection of the licensee's program for the procurement and dedication of commercial grade items used in safety-related applications at SONGS identified some weaknesses. These weaknesses included incomplete identification of appropriate safety functions, and incomplete specification and verification of specific safety function performance characteristics. To the licensee's credit, many of the dedication program weaknesses had been self-identified before the NRC's inspection, and the licensee has committed to fully upgrade their procurement program to staff guidelines by January 1993.

Late in the assessment period, the licensee made several changes to the engineering organization and was evaluating interface points with other organizations in an effort to enhance performance in this area. The effectiveness of these changes could not be evaluated during the period.

2. Performance Rating

Performance Assessment - Category 2.

3. Board Recommendations

While some improvement was recognized in this area, it has been inconsistent and a number of areas identified for attention in the last SALP report showed little improvement. The Board determined that the current rate of improvement does not justify a trend. Licensee management should emphasize the need to resist the tendency toward expedient resolution of emerging issues. More thorough and independent reviews of engineering work are encouraged. In addition, improvement in the interface between

engineering and other organizations, and assessment of the responsibilities and workload of system engineers is encouraged.

## G. Safety Assessment/Quality Verification

### 1. Analysis

Routine resident inspections, with ongoing assessment by NRR, were conducted during this SALP assessment period. Review of this functional area during these inspections accounted for approximately 19 percent of the total inspection effort at San Onofre.

Following the previous SALP period, the licensee was rated Category 2, with an improving trend. The Board recommended that the licensee emphasize more thorough assessment of plant problems, enhance the effectiveness of the corrective action program, and improve the quality and timeliness of licensing submittals. The Board also recommended that the licensee update the Final Safety Analysis Report (FSAR) and emphasize effective implementation of the Quality Assurance (QA) audit program.

Licensee performance in this functional area continued to improve in certain areas during this assessment period. In particular, the Nuclear Oversight Division (NOD) became a very strong contributor in assessing plant performance. This was accomplished through implementation of self-assessment programs in many of the functional areas, detailed root cause evaluations, probing audits and surveillances, and enhanced plant monitoring. Progress was made by the licensee in updating the FSAR during this period. Progress was also made in addressing previous Board recommendations, but recent observations indicated continued weaknesses in: management assessment of emerging issues, including effective communication with the NRC on these issues; corrective action followup; and accuracy of submittals to the NRC.

The NOD expended more effort on self-critical evaluations this period, focusing on excellence in addition to compliance. Examples included outage activity surveillances, probabilistic risk assessments (PRAs), and organizational common cause analysis of programs. Some significant issues were identified and Quality Action Teams (QATs) were implemented to address many of the program weaknesses identified.

Root cause evaluations were more proactive during this period. The licensee performed in-depth root cause assessments of programs, human performance, organizations, and equipment deficiencies, such as a detailed evaluation of the root cause for leakage from secondary safety valves, resulting in setpoint drift.

The licensee implemented a fully integrated surveillance and audit plan this period. Many audits included performance based

surveillances designed to make program implementation assessments. Program weaknesses identified during these audits and surveillances included inadequate control of weld filler material and improper control of temporary modifications. To support the effort, the licensee prepared systems training booklets to enhance the effectiveness of NOD personnel in performing audits and surveillances. Additional training was conducted in performance of root cause analysis, and was attended by personnel from many different organizations. In addition, QA and QC personnel were certified in accordance with Institute of Nuclear Power Operations standards during the period.

The licensee further enhanced their plant performance monitoring programs during this assessment period. The NOD published quarterly performance assessment reports to identify areas of strength and weakness, which were embraced by the responsible organizations. The Area Monitoring Program was also refined to provide more in-depth walkdowns of plant systems and areas.

The licensee was involved in several projects that exhibited a commitment to improve the safety of the plant and its operation. Examples included the licensee's participation in the Technical Specification improvement program and compilation of the current licensing basis for Units 2 and 3. The licensee is also using probabilistic risk analysis techniques to calculate the core damage risk due to actual equipment unavailability, which assists the plant staff in maintaining the plant at the optimum safety level.

Some instances were observed in which the licensee management permitted assessments of problem situations that were too narrowly focused, or communicated their assessments to the NRC in an ineffective manner. For example, the original assessment of the Unit 1 RWST leakage issue did not adequately address the extent and mechanism of corrosion of the tank. The licensee was not effective in communicating the basis of their understanding of the location of a leak and the configuration of the piping components in a Unit 3 pressurizer instrument line and initially resisted staff recommendations to visually inspect the source of the leakage. The initial operability assessment of the cracks discovered in the vital batteries in Unit 3 was not comprehensive and the NRC staff was not informed in a timely manner of this issue. In addition, the initial assessment of a valve accumulator piston misalignment did not identify the potential of the valve to become inoperable. As a result of this concern, the licensee committed to improve its communications of emergent issues with the NRC staff, which has been evident in the latter part of this SALP period.

The licensee's efforts to improve the corrective action program were generally effective, but the results were not uniform in that several instances of inadequate corrective action followup were

noted during the period. For example, surveillances implemented as a result of a Unit 2 turbine driven auxiliary feedwater (AFW) pump overspeed event in 1990 were ineffective in preventing a subsequent overspeed trip of the pump, and corrective actions for a 1990 QA audit were inadequate in preventing similar M&TE problems this assessment period.

Toward the latter part of the SALP period, NOD implemented a peer review of all problems resulting in either a corrective action request or problem review report, in an attempt to ensure that issues were properly categorized and that effective corrective actions were proposed.

While the licensee expanded efforts to improve the quality and timeliness of submittals to the NRC, the results during the SALP was mixed. In some instances, submittals were timely and accurate, such as for Station Blackout, but others were not. For example, a licensee event report (LER) for Unit 1 Halon system inoperability contained inaccurate information. Together with the inoperability of the Halon system, these problems resulted in escalated enforcement. A temporary waiver of compliance to facilitate testing of Unit 2 low pressure safety injection check valves and a relief request from ASME Section XI Code requirements also contained errors. Early in the period, revisions to four LERs were outstanding for a long period of time. The licensee was attempting to reduce the backlog, although a few still remained outstanding (two years or more) and were still awaiting revision.

2. Performance Rating

Performance Assessment - Category 2, improving.

3. Board Recommendations

The Board acknowledged the superior performance of the Nuclear Oversight Organization during this period. However, more effective management involvement in assessment, resolution, and communication with NRC of emerging issues is recommended. In addition, more aggressive corrective action followup and more emphasis on accuracy of submittals to the NRC was encouraged.

IV. Supporting Data and Summaries

A. Licensee Activities

The three units operated routinely at nominal full power (for Unit 1, 91%) during the SALP period, except for the events or outages identified below.

Unit 1

October 17, 1991

Automatic trip caused by automatic bus

transfer failure. Unit operation resumed on October 22, 1991.

November 15, 1991

Shut down to conduct an inservice inspection of all three reactor coolant pump flywheels. Unit operation resumed on November 19, 1991.

### Unit 2

August 17, 1991

Shut down for Cycle VI refueling and maintenance outage. Operation resumed on November 21, 1991.

March 13, 1992

Shut down to perform design basis testing of the safety injection miniflow motor operated valves. Unit operation resumed on April 2, 1992.

April 24, 1992

A turbine trip caused a reactor trip. The turbine trip was due to the loss of a 480 VAC transformer which supplied several turbine control system and main feedwater pump auxiliary equipment loads. Operation resumed on April 26, 1992.

July 31, 1992

Automatic reactor trip due to a sensed undervoltage condition created when a potential transformer drawer was opened. Operation resumed on August 2, 1992.

### Unit 3

January 24, 1992

Shut down for Cycle VI refueling and maintenance outage. Operation resumed on March 30, 1992.

April 21, 1992

Shut down for main generator vibration problems. Operation resumed on April 23, 1992.

April 24, 1992

A manual reactor trip was initiated when control bleedoff flow for reactor coolant pump P004 decreased to zero. Operation resumed on May 9, 1992.

May 15, 1992

Automatic trip due to a low departure from nucleate boiling ratio (DNBR) occurred. The low DNBR signal was generated when a reactor coolant pump tripped as a result of one of the pump motor surge capacitors faulting to ground. Operation resumed on



May 20, 1992.

September 16, 1992

Shut down to repair the pressurizer pressure instrument root valve, and the core protection calculator channel "C" cold loop temperature detector. Operation resumed on September 19, 1992.

**B. Inspection Activities**

Forty-seven routine and special inspections were conducted during this assessment period (August 1, 1991 through November 30, 1992) as listed below. Significant inspections are listed in paragraph IV.B.2.

1. Inspection Data

Inspection Reports 91-21 through 91-37, 91-39, 91-01 through 91-13, and 91-15 through 91-30.

2. Special Inspection Summary

Special inspections included the following:

- 91-32 Fire protection inspection
- 91-36 4160 Volt switchgear room Halon system inspection
- 92-02 January 13 through February 11, 1992: Team inspection on safety-related motor operated valves.
- 92-15 April 6 through April 27, 1992: Team inspection on operability and reliability of check valves in safety-related systems.
- 92-19 August 24-28, 1992: Chemistry team inspection.

**C. Enforcement Activity**

Inspections during this period identified 35 violations, of which 16 were non-cited violations. Two of the cited violations were categorized as a Severity Level III problem and resulted in the issuance of a civil penalty (Inspection Report No. 91-36).

**D. Confirmatory Action Letters**

None.

**E. Licensee Event Reports**

LERs were issued for the three units during this assessment period as shown below.

<u>Unit</u>	<u>No. of LERs</u>	<u>LER Numbers</u>
1	10	91-14 thru 91-21; 92-01 thru 92-02
2	22	91-10 thru 91-19; 92-01 thru 92-12
3	10	91-03 thru 91-09; 92-01 thru 92-04



bcc w/enclosure:  
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Docket File  
Resident Inspector  
Project Inspector  
G. Cook  
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*LR*  
LReese  
12/23/92

*A*  
FHuey  
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*JM*  
MWillis  
12/23/92

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12/28/92

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