

INITIAL SALP BOARD REPORT
U.S. NUCLEAR REGULATORY COMMISSION
REGION V
SYSTEMATIC ASSESSMENT OF LICENSEE PERFORMANCE
INSPECTION REPORT NOS. 50-275/91-19 and 50-323/91-19
PACIFIC GAS & ELECTRIC COMPANY
DIABLO CANYON POWER PLANT
JANUARY 1, 1990, THROUGH JUNE 30, 1991

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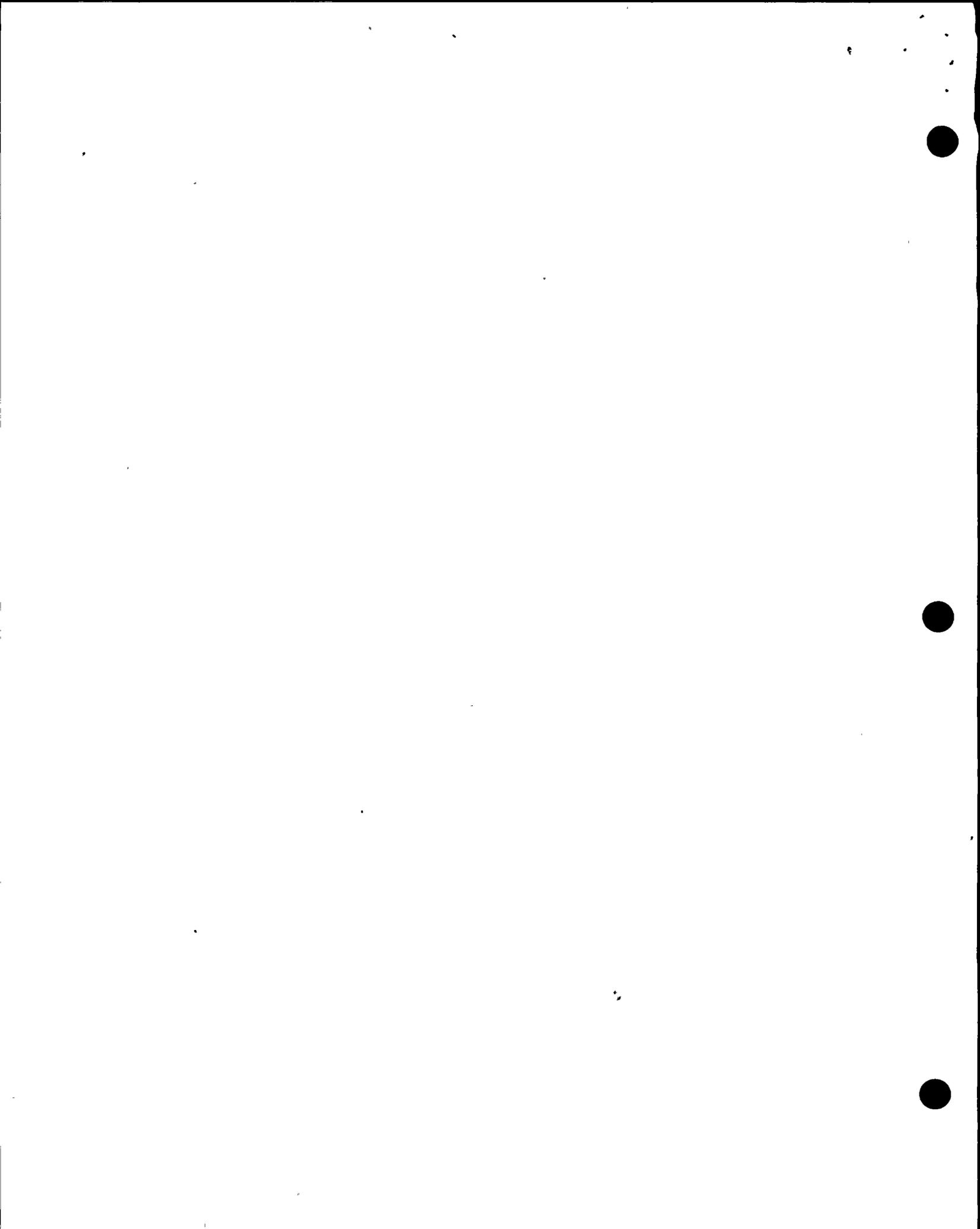
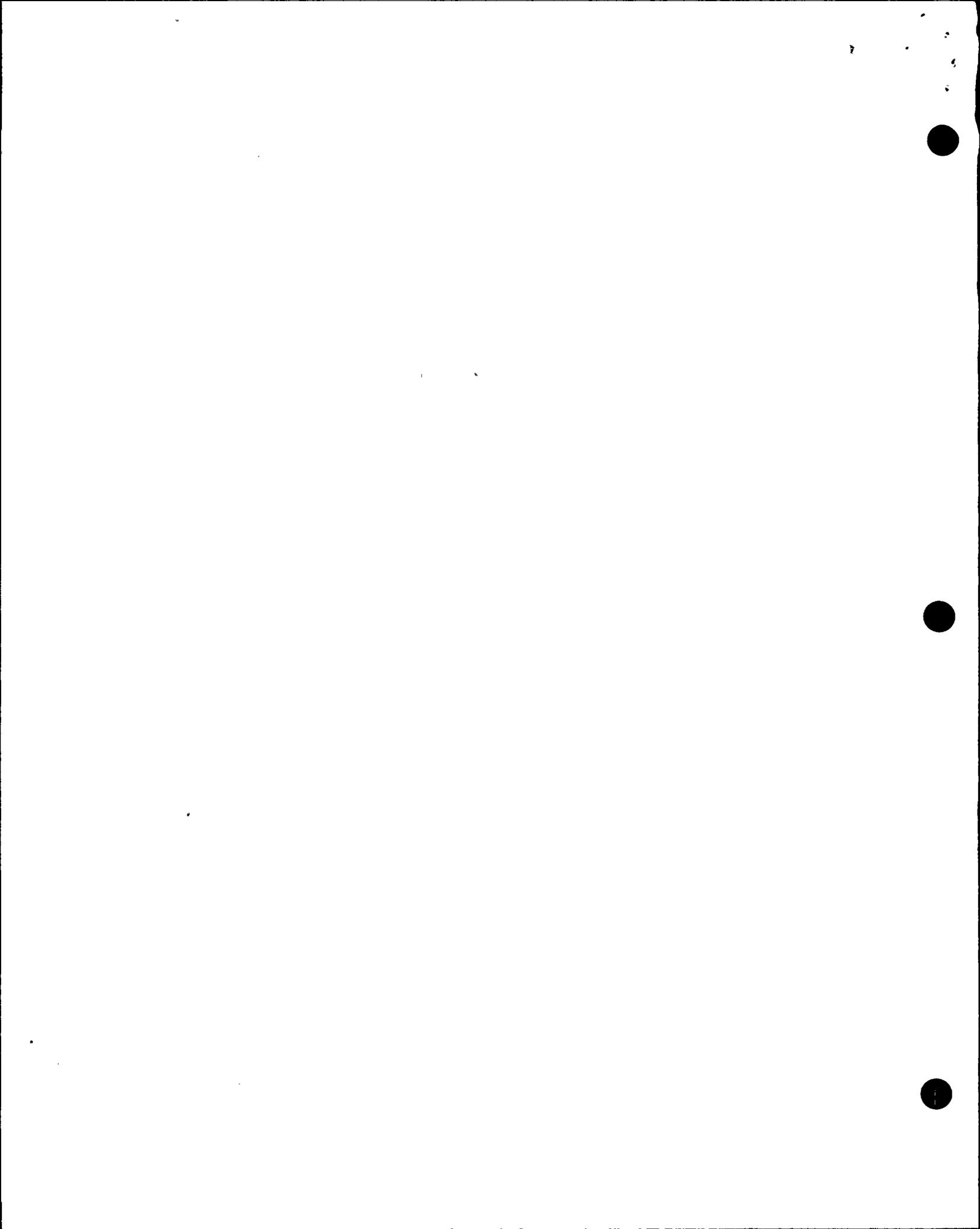


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I. INTRODUCTION

The Systematic Assessment of Licensee Performance (SALP) 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 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 July 30, 1991, to review observations and data on performance, and to assess licensee performance in accordance with NRC Manual Chapter 0516, "Systematic Assessment of Licensee Performance."

This report is the NRC's assessment of the licensee's safety performance at the Diablo Canyon Power Plant for the period January 1, 1990, through June 30, 1991.

The SALP Board for Diablo Canyon was attended by:

Board Chairman

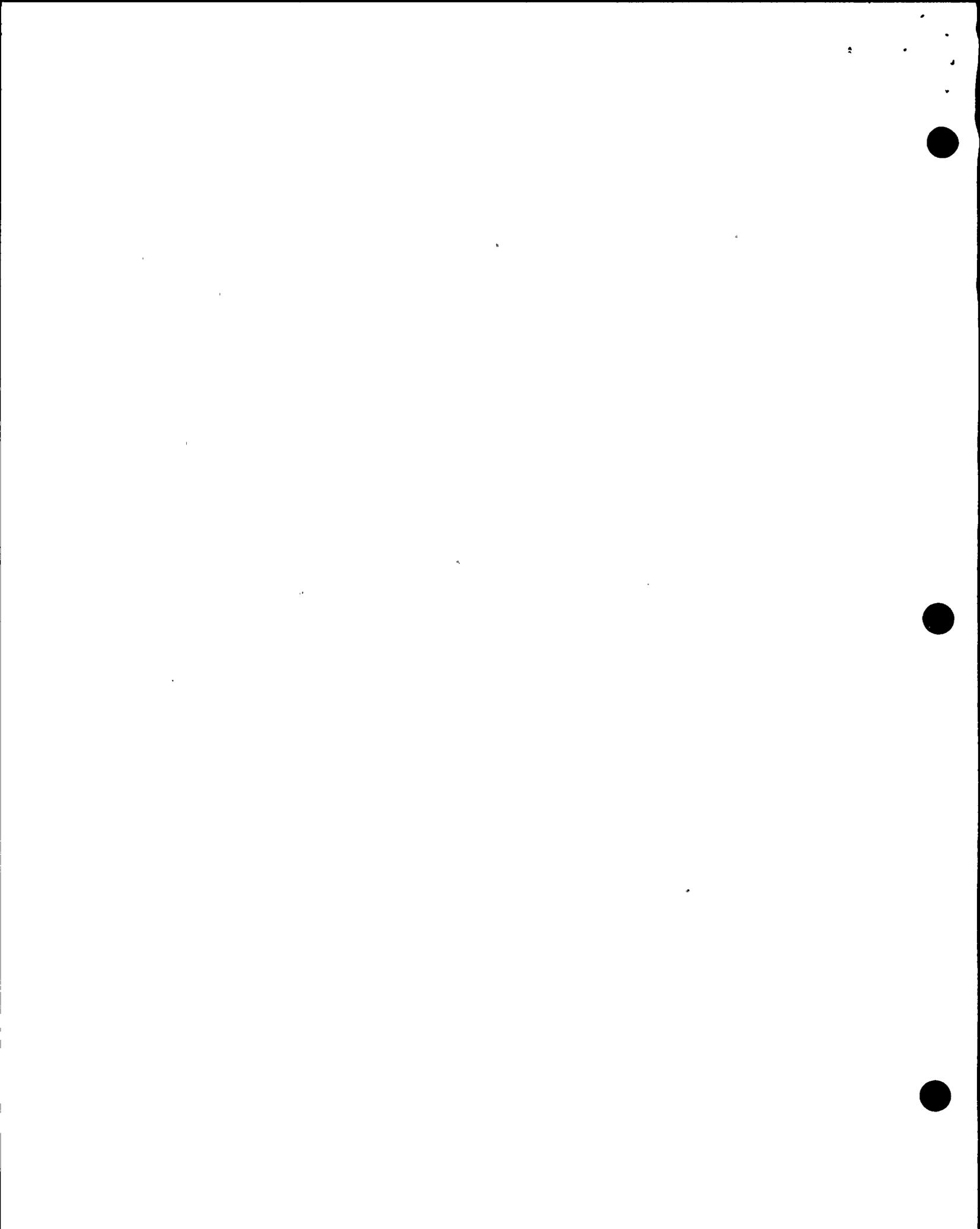
R. Zimmerman, Director, Division of Reactor Safety and Projects, RV

Board Members

J. Dyer, Project Director V, Division of Reactor Projects, NRR
 K. Perkins, Deputy Director, Division of Reactor Safety and Projects, RV
 H. Rood, Project Manager, PDV, NRR
 G. Yuhas, Chief, Reactor Radiological Protection Branch, RV
 D. Kirsch, Chief, Reactor Safety Branch, RV
 S. Richards, Chief, Reactor Projects Branch, RV
 P. Morrill, Chief, Reactor Projects Section I, RV
 P. Narbut, Senior Resident Inspector, RV

Other Attendees

R. Huey, Chief, Engineering Section, RV
 J. Reese, Chief, Safeguards, Emergency Preparedness and Non-Power Reactor Branch, RV
 G. Good, Emergency Preparedness Analyst, RV
 B. Olson, Project Inspector, RV
 D. Schaefer, Safeguards Inspector, RV
 M. Cillis, Radiation Specialist, RV
 K. Johnston, Project Inspector, RV
 H. Resides, Radiation Specialist, RV
 A. Dummer, Reactor Inspector, NRR



II. SUMMARY OF RESULTS

Overview

The licensee's overall performance level during this assessment period was acceptable in all areas. Examples of particularly good performance were demonstrated by relatively event-free operation, low occupational radiation exposure, completion of the Long Term Seismic Program, and your performance based audits.

The strengths observed in the Operations, Radiological Controls, Engineering/Technical Support and the Safety Assessment/Quality Verification functional areas resulted in these areas being rated as Category 1. The Board deliberated at length for the functional area of Safety Assessment/Quality Verification as a result of instances where problems were not aggressively resolved but concluded that the licensee's overall performance and corrective actions outweighed earlier problems.

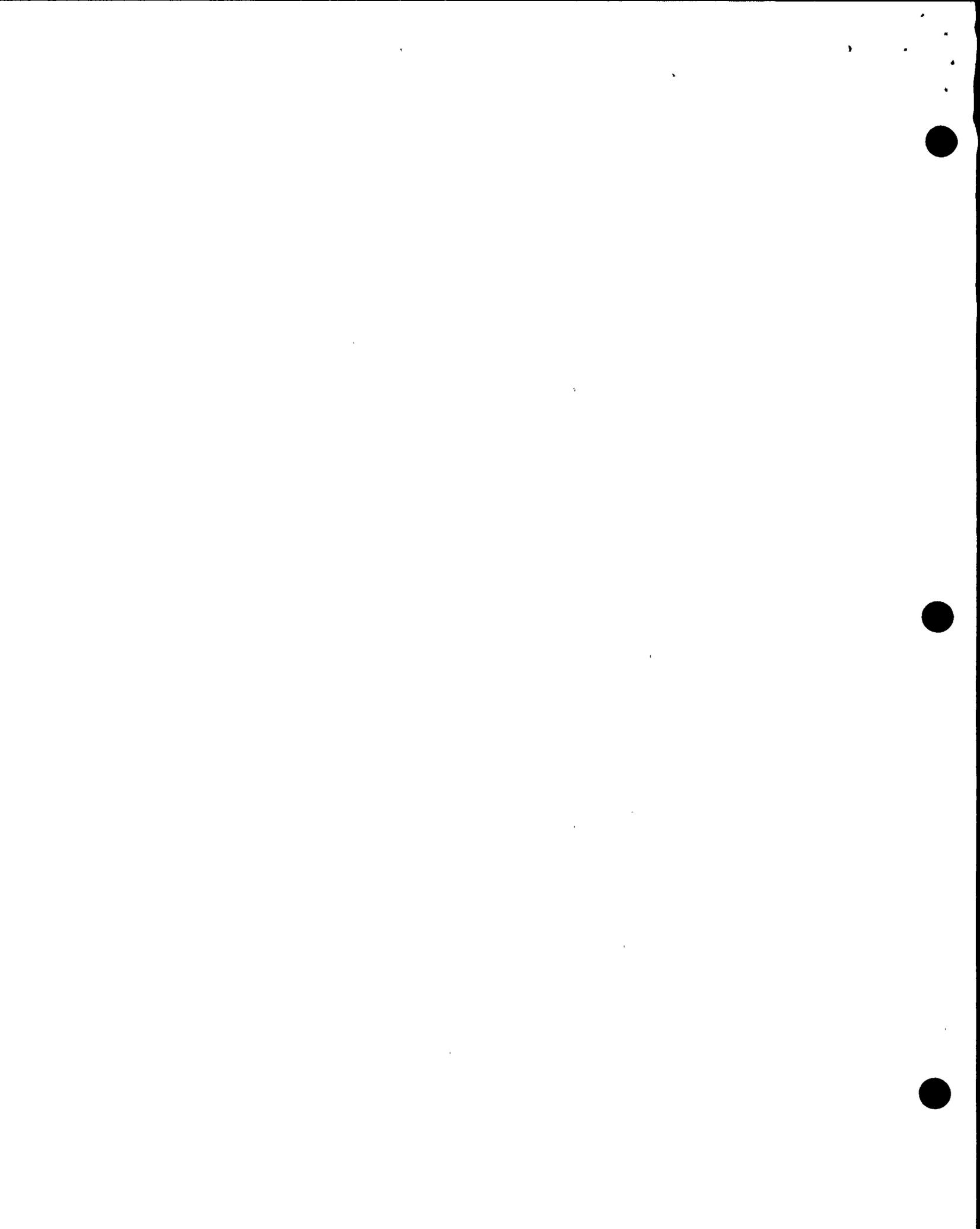
In rating the functional area of Emergency Preparedness as Category 2, the Board noted that problems from past assessment periods resurfaced again, resulting in five repeat findings during the October 1990 exercise. Based on this and other findings, the Board reached the Category 2 conclusion. Likewise, the number of enforcement actions in the functional area of Security did not demonstrate superior performance. Security was rated as Category 2, Improving, in recognition that the licensee had reduced the number of events involving improper entry into vital areas in the latter portion of the evaluation period.

Maintenance management appears to need to improve the timeliness of dealing with problems. In rating the functional area of Maintenance/Surveillance as Category 2, the Board discussed various problems that were allowed to exist until the plant was undesirably affected or high level management involvement was required to resolve the problem. It appeared that Maintenance could improve their interaction with Engineering in an effort to reduce the time that problems remain unresolved.

Overall, the Board recommends that problems need to be aggressively pursued in all functional areas. This emphasizes the continuing need for management involvement and oversight when issues first develop.

The performance ratings during the previous assessment period and this assessment period according to functional areas are given below:

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



III. PERFORMANCE ANALYSIS

A. Plant Operations

1. Analysis

Evaluation of this area was primarily based on the results of 13 routine inspections by the resident inspectors and the observations of the operator licensing staff. Twenty-nine percent of the total inspection effort was expended in this functional area. The licensee's strengths in this area included relatively event-free operation and a knowledgeable and generally well-trained staff. Weaknesses identified were associated with untimely operability determinations and occasional reluctance to involve plant management when problems arise.

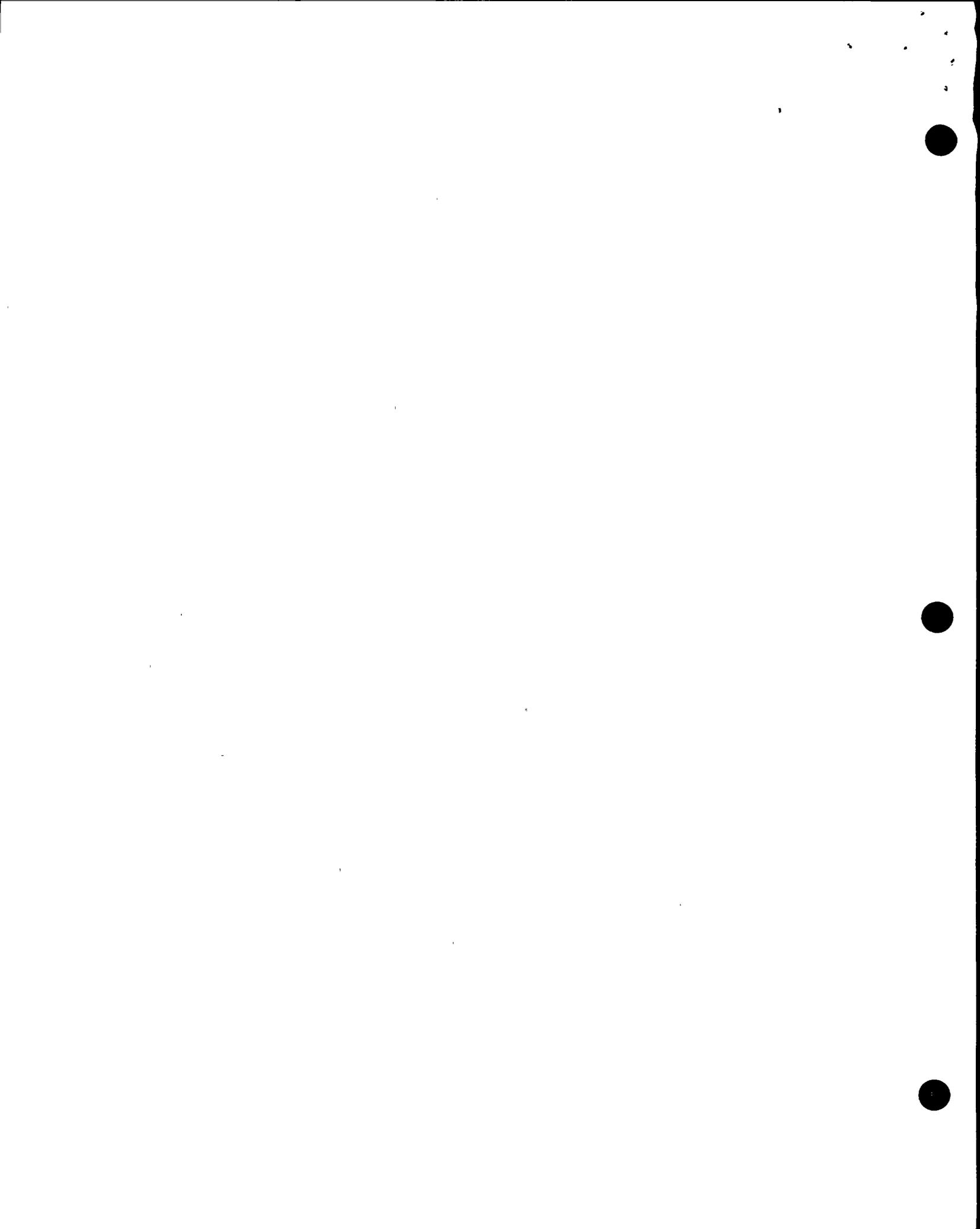
Licensee performance in this functional area during the previous SALP period was rated as Category 1 with relatively few events attributed to operational causes. Superior performance on the part of operations continued throughout this assessment period. Although four Unusual Events were declared during this period, the causes were not associated with operations. Additionally, operators managed the plant well after events, such as when steam dump valves failed open following reactor plant trips in December 1990 and April 1991. Operator actions following plant trips appeared to be consistently superior.

The licensee demonstrated strength in their short term analysis and review of operating events. The licensee's "event response plans" continued to provide a formal identification of plant problems following events. Additionally, corporate management exhibited a commitment to the assurance of quality, as demonstrated when they risked a record Unit 2 run to reduce power and repair a feedwater control valve oscillation problem.

Additional strengths observed in this functional area include the conservative management of plant conditions during outages, specifically the minimization of mid-loop operations, and the development of equipment control guidelines for plant equipment not covered by Technical Specifications. Also, during this assessment period, an examination of the fire protection program found that there was strong management support for the program.

Escalated enforcement action was taken during the previous SALP period regarding the licensee's failure to take timely corrective actions in response to repeated equipment lineup problems. During this period, the licensee's corrective actions have proven to be effective with only an occasional lineup problem: the one exception was when an auxiliary operator disabled two residual heat removal pumps due to not following written instructions. This event was immediately detected and corrected by the licensee.

The previous SALP noted some inconsistency in the ability to recognize and address problems in a timely manner. During the current period, some weaknesses in operability determinations were observed. Less than conservative action resulted from untimely operability decisions pertaining to the vibration and loose parts monitors, the auxiliary feedwater pump steam supply stop valve, and the ventilation supply for the auxiliary feedwater pump rooms. The concerns regarding the operability determinations appear to be a result of a lack of formality in the decision making process.



Another apparent weakness observed during this assessment period was a reluctance on the part of shift management to contact plant management when addressing operational problems. This reluctance was not widespread, but did occur twice on the backshift. In one instance, during a plant startup, a high steam generator water level tripped the main feedwater pumps. The operators restored the plant conditions and continued the startup without informing their management of the occurrence. In the other instance, an RHR pump tripped while filling the refueling cavity. The operators restored RHR and concluded that the event was not reportable. After plant management was informed of the event the next morning, the event was classified as reportable.

The licensee's operations training program continues to be well-defined and implemented with dedicated resources. The overall pass rate on both initial qualification and requalification exams was 100 percent. While inadequate training was rarely the cause of an event, operator performance during the October 1990 emergency preparedness exercise, where offsite dose assessments were not made in a timely manner, demonstrated an isolated training weakness. Additionally, during an Unusual Event on May 17, 1991, a non-licensed auxiliary operator performed several activities in the control room that may require either a license or additional training. This is being evaluated by the NRC. This occurrence late in the SALP period may point to the need for increased operating crew training and coordination.

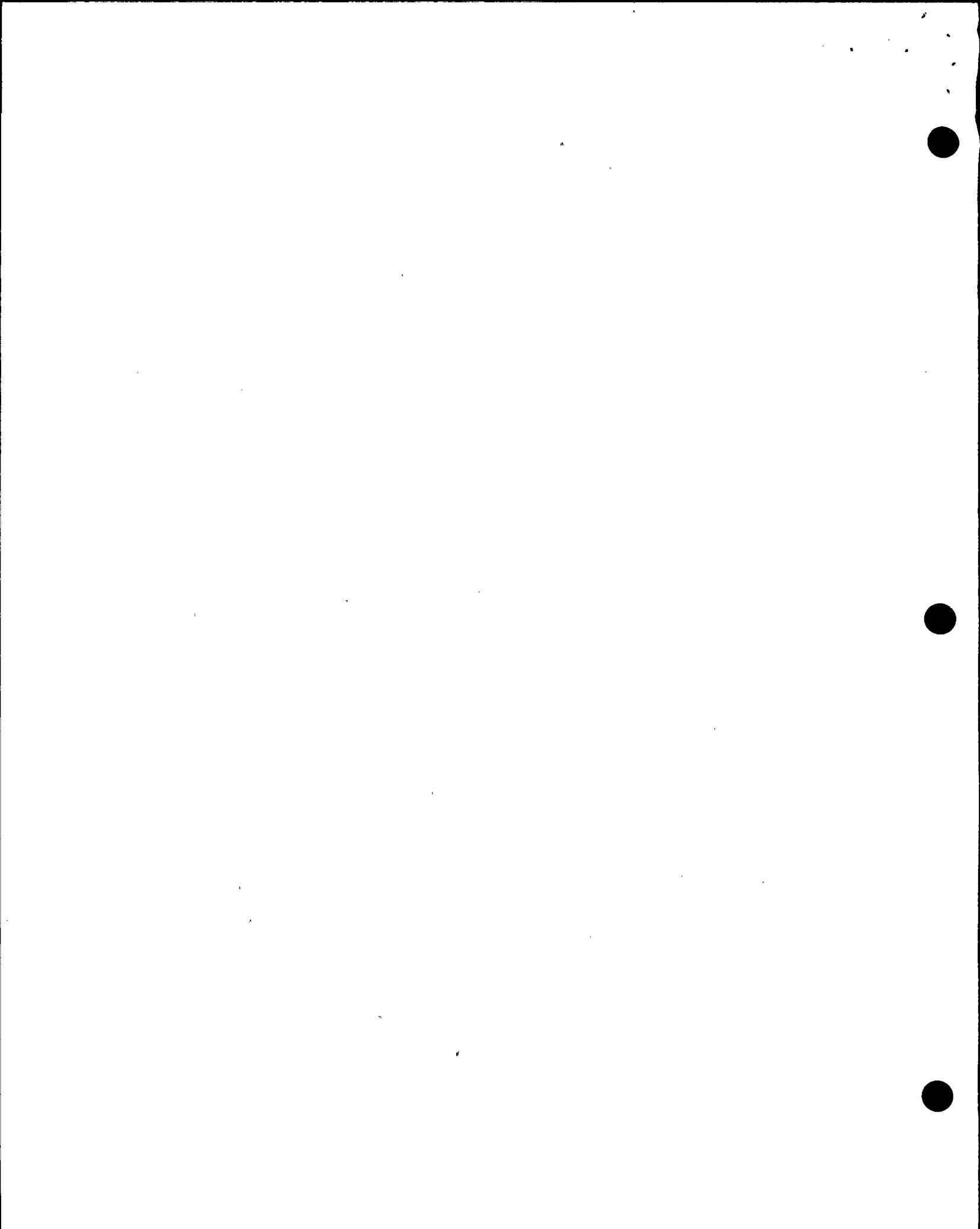
The single violation in this functional area during this assessment period concerned a lack of administrative controls to ensure operability of the positive displacement charging pump. Five of the 14 Licensee Event Reports (LERs) attributed to operations involved personnel errors associated with either poor communications or not following procedures. Three of the LERs pertained to equipment failures. The remaining LERs did not point to any single concern.

2. Performance Rating

Performance Assessment - Category - 1

3. Recommendations

Management should ensure that their operations staff involves them in complex decisions and should increase the formality and timeliness with which operability decisions are made. Operations staff should involve management when equipment is not performing properly or is inoperable, such as the vibration and loose parts monitor and the feedwater regulating valves. Operations management should raise these issues to a higher level when they persist. Operating crew training and coordination should be assessed to ensure operational effectiveness.



B. Radiological Controls

1. Analysis

Inspections conducted during this SALP period found that the licensee has been proactive in assuring quality and innovative in their approach to reducing occupational dose and radioactive effluents. Approximately five percent of the total inspection effort was devoted to this functional area by the regional inspectors during this assessment period.

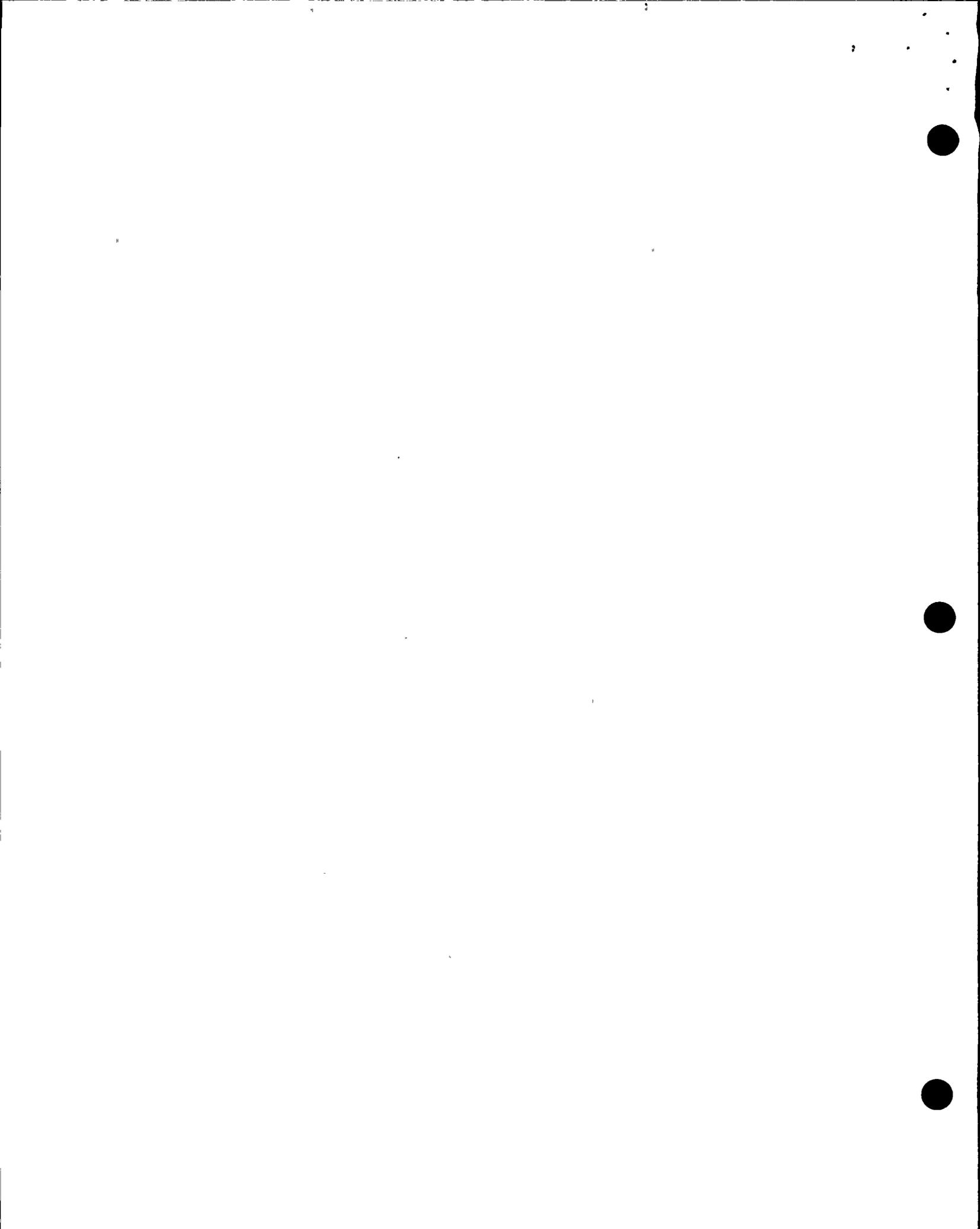
The licensee's performance in this functional area during the previous SALP period was a Category 1. The previous SALP board recommended that the licensee continue their aggressive approach towards ALARA and improve the quality of health physics and work practices during outages.

Management has been consistently involved in assuring quality. They implemented a positive incentive program which included time off for achieving ALARA goals. The 1990 site occupational dose was 352 person-rem. The volume of solid radioactive waste shipped for disposal was reduced to 2935 cubic feet in 1990, and liquid and gaseous effluents were maintained at a small fraction of the Technical Specification limits. These are substantial improvements over previous years' activities.

Corporate involvement was evidenced by frequent site visits and thorough reviews of outage activities. Decision-making has involved appropriate levels of management as noted in the licensee's response to leaks in the letdown piping, containment entries at power, and a major upgrade of radiation monitoring and analytical support equipment. Radiation protection and chemistry policies were well documented, goals were realistically established and well publicized, and workers were familiar with management expectations.

Some minor weaknesses were identified. These involved the number of personnel contamination events, the backlog of fixed and portable radiation detection instruments needing calibration, maintaining administrative control of keys providing access to very high radiation areas, and training of dosimetry clerks and those personnel involved in the preparation of radioactive waste for shipment.

The licensee's approach to the resolution of technical issues was conservative, timely, and technically sound. Examples included proactive efforts to minimize corrosion in the steam generators by removal of ionic impurities in the steam generator tube crevices, testing the use of hydrazine to further reduce dissolved oxygen in the condensate and feedwater system, and the installation of an on-line ion chromatograph as well as an on-line sodium monitor to immediately identify which polisher beds have high sodium and sulfate content in their effluent. Another technical issue involved the development of methods to improve the effectiveness of the liquid radwaste processing system (LRW) to reduce effluent activity. Failure of a solidification process to produce a stable product that met burial site criteria was thoroughly researched and the root cause was identified as a manufacturing defect. Another project taken on by the licensee involves a comprehensive program to upgrade the radiation monitoring system (RMS). This very significant effort is expected to take approximately two years to complete. The first channel of the new RMS is scheduled for installation in the fall of 1991. Detailed analysis of each outage by the licensee has revealed opportunities for additional dose reductions and improved goals.



Licensee management has supported training programs for the chemistry and radiation protection technicians, supervisory personnel, and the technical staff with state-of-the-art training facilities and dedicated resources. Programs include training to further develop the knowledge and skills of staff members by participating at onsite and offsite educational opportunities such as: steam generator owners group meetings, EPRI conferences, low-level radwaste user group meetings, and periodic rotational assignments of the radiation protection technician staff at other nuclear facilities. Examples also include a five week supervisory development course for foremen and supervisory personnel and participation of the training staff in outage activities as a means of determining areas that can be improved in the training program. The licensee has initiated training for their staff on the new 10 CFR Part 20 requirements.

The licensee has well staffed site and corporate chemistry and radiological protection groups. Staffing includes an active and experienced chemistry and radiation protection ALARA work planning group. Authorities and responsibilities were defined by management and understood by the staff. Key positions were generally filled on a priority basis. All site departments communicate effectively with the health physics and chemistry organizations.

One Severity Level IV violation and six Licensee Event Reports (LERs) were identified in this functional area during the assessment period. The violation concerned a failure to perform leak checks of two licensed sources. Neither the violation nor the LERs indicated a programmatic breakdown of the radiation protection program. The licensee's root cause and corrective actions were prompt and effectively implemented as evidenced by lack of repeated events.

2. Performance Rating

Performance Assessment - Category - 1

3. Board Recommendations

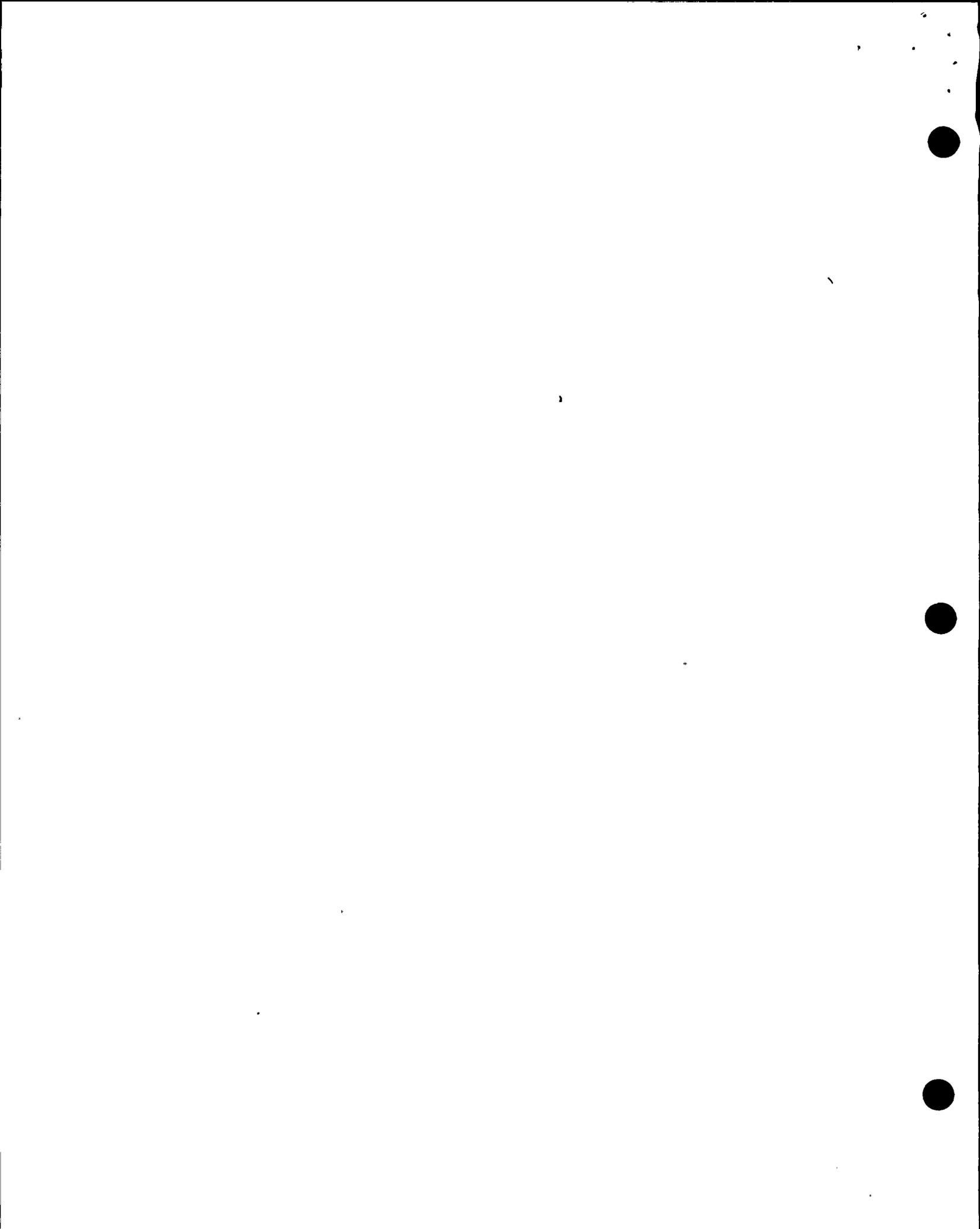
Management should continue to provide their full support to site and corporate staff initiatives to maintain and improve the present performance level. Some additional emphasis seems appropriate towards correcting minor weaknesses in controlling personnel contamination, reducing the backlog of non-Technical Specification radiation monitoring equipment needing calibration, and training of dosimetry clerks and radioactive waste handlers.

C. Maintenance/Surveillance

1. Analysis

The maintenance and surveillance functional area was observed routinely during the assessment period by resident and regional inspection personnel. Twenty-one percent of the inspection resources were devoted to this functional area.

Licensee performance in the maintenance and surveillance functional area during the previous SALP period was rated as Category 2, Improving. The previous SALP recognized licensee advancements in proceduralization, control of backlog, and effective outage management. The previous SALP also noted



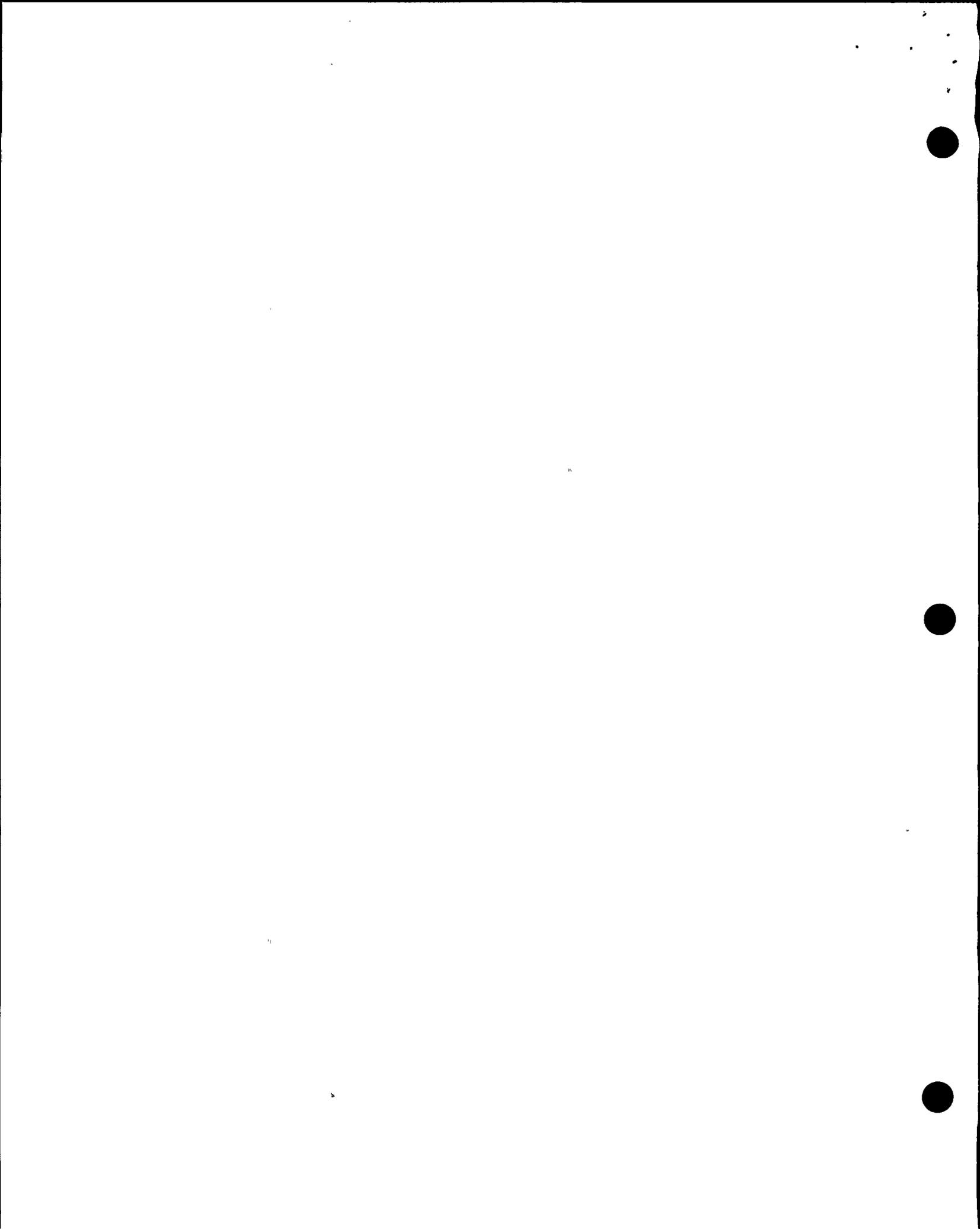
that the licensee was slow to address some concerns, including plant material condition, such as the intake structure. The previous SALP recommendations to licensee management included a need for stronger management oversight. The major issues of the previous SALP included the use of excessive overtime without management awareness and improper maintenance of the containment sumps and the auxiliary feedwater pump trip valve.

The maintenance and surveillance area during this SALP period has been slow to show consistent improvement. This conclusion is based largely on examples of a lack of management aggressiveness in the resolution of problems and examples of a lack of maintenance management oversight. The most notable indication of lack of oversight was the failure to resolve long-standing mechanical maintenance measuring and test equipment problems. These problems were the subject of several licensee audits and surveillances. Subsequently, the NRC made this area the subject of three special inspection reports, including an enforcement conference. The end result of this problem was that the licensee decided to close their mechanical maintenance measuring and test equipment shop and assign these duties to the instrument and control shop. A second example dating back to the previous SALP was water intrusion and component corrosion in the intake structure. Conditions in the intake have continued to worsen and now include concrete spalling, reinforcing bar corrosion, and component corrosion wastage.

Management of maintenance and surveillances to minimize equipment out-of-service times has been improving. Several errors were made in taking equipment out of service, but were identified by the licensee. Likewise, outage management has generally been superior and has minimized mid-loop operations while maximizing the availability of electrical power supplies.

Management assurance of quality has generally been shown to be acceptable in attributes such as prior planning, assignment of priorities, and procedures for the control of activities. These policies are adequately stated and generally understood but not always practiced. For example, maintenance personnel signed off work steps before they were performed during the installation of an auxiliary feedwater pump governor, maintenance personnel failed to follow administrative procedures by not identifying spring pack relaxation of important motor operated valves, and a fire pump was repeatedly misassembled. Decision-making appears to be done at a level which ensures management review, but that review is sometimes non-conservative. A March 7, 1991, loss of offsite power event was caused by maintenance personnel using a crane in close proximity to high voltage energized electrical lines despite the licensee's specific review of a similar event at the Vogtle power plant. Other examples of a lack of conservatism and inquisitive attitudes were shown by followup after the December 24, 1990, reactor trip and safety injection in which a pressurizer spray valve failed open due to a missing locking device, and a steam dump valve failed open due to a broken stem. Licensee maintenance management did not thoroughly investigate the steam dump valve problem prior to restarting. Subsequently, during a plant trip, on May 17, 1991, another steam dump valve failure caused a safety injection and excessive reactor cooldown. After this event adequate attention was given to resolve problems with the steam dump valves.

Staffing in maintenance appears to be adequate although work hour changes for maintenance staff have left Mondays and Fridays more lightly



staffed. Training and qualification in the maintenance area appear to be well defined and implemented. Licensee audits have identified, however, that untrained and uncertified personnel have sometimes been utilized due to a lack of discipline by supervisory maintenance personnel in assigning work. In January 1991, Instrumentation and Controls (I&C) personnel removed the wrong Unit's power range nuclear instrument due to not following self-verification policy. In May 1991, the wrong power range instrument was removed again, resulting in a reactor trip. These examples show that although the licensee has adequate training, procedures, and policies in the maintenance area, they have not been consistently followed by working and middle level management personnel. Maintenance management does not appear to have emphasized these issues sufficiently.

During the SALP period, the licensee has improved visibility in some pump rooms through painting the rooms white. In general, the licensee has instituted an energetic painting program which is an important element in maintaining plant material condition. In response to industry and NRC initiatives, the licensee has started to trend important safety equipment out-of-service times and has started to consider programs for utilizing probabilistic risk assessment to perform risk evaluations of preventive maintenance activities. Additionally, a predictive maintenance group has been formed, and the licensee is moving towards a reliability centered maintenance program.

The licensee's surveillance test program has generally been adequately conducted. Procurement control and storage of components has been examined and found to be well controlled and executed. Likewise inservice inspection and testing have been examined and found to be generally well performed. One area that requires improvement is a reduction in the backlog of radiation detecting instruments that require calibration. The backlog appears to have developed as a result of I&C not fully supporting the health physics organization.

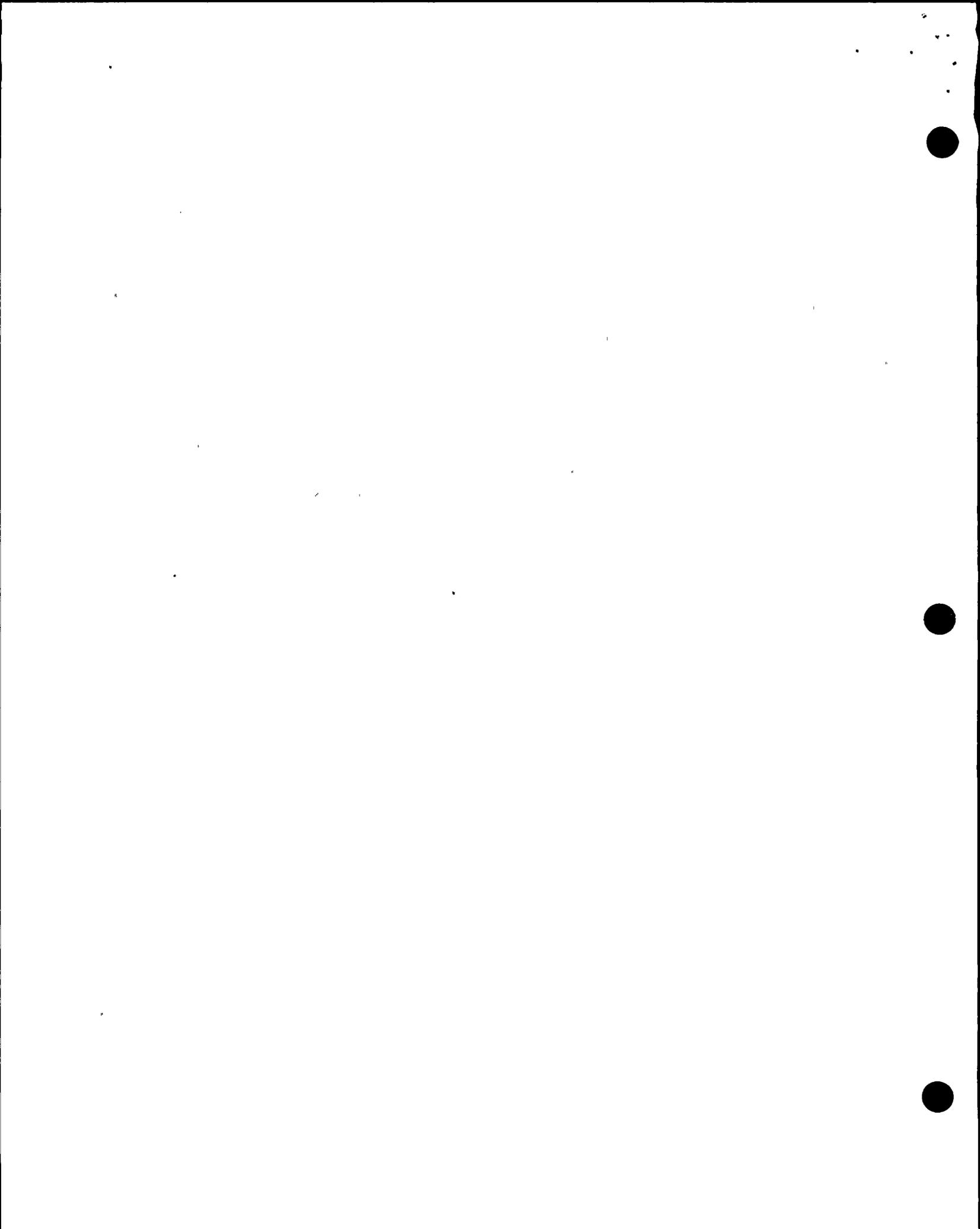
There were nine Level IV violations and 16 Licensee Event Reports (LERs) associated with this area. Fifteen of the LERs were attributed to personnel error and point out, as previously discussed, that training, procedures, and policies are not always consistently followed.

2. Performance Rating

Performance Assessment - Category - 2

3. Recommendations

Management should provide more timely attention to preventing and correcting degradation of the plant material condition. The licensee should ensure that maintenance management develops an inquisitive attitude toward plant hardware anomalies such that root causes of hardware problems are identified and resolved. The timeliness of dealing with problem areas should be improved. The licensee is encouraged to continue to develop their initiatives regarding preventive maintenance risk assessment, predictive maintenance, and outage management strategies.



D. Emergency Preparedness

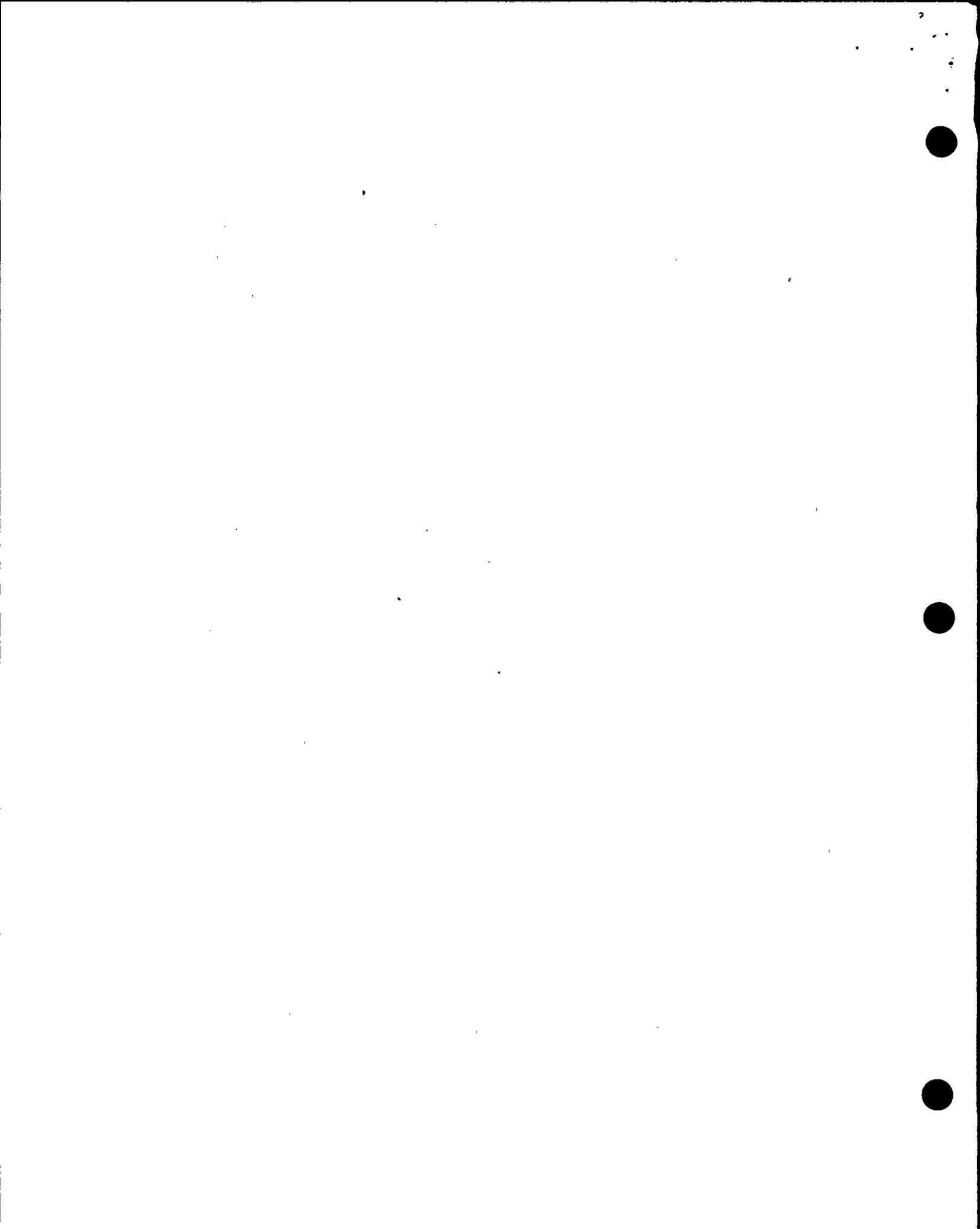
1. Analysis

The licensee's performance in this functional area during the previous SALP period was rated as Category 1. The previous SALP Board recommended that problems related to emergency preparedness (EP) be corrected in a more timely manner, and that licensee management take the necessary steps to strengthen the engineering support in the Technical Support Center (TSC) and Emergency Operations Facility (EOF). During the current SALP period, weaknesses were identified in the effectiveness of the licensee's EP corrective action program, the control of the drill program, and the effectiveness of the EP training program as demonstrated by performance during drills and exercises. The licensee's actions to address NRC concerns about on-shift dose assessment capabilities and their initial actions to address recurring inspection findings was considered to be a strength. The licensee's EP program was observed by both the regional and resident inspectors during three routine inspections, an annual emergency exercise, and several operational events. Approximately five percent of the total inspection effort was devoted to this functional area.

Inspections conducted during this SALP period identified weaknesses in licensee management's oversight and control of the implementation of the EP corrective action program, and the drill and exercise portion of the EP training program. Many of these weaknesses were reflected in the licensee's declining performance during the October 1990 annual exercise. During the 1990 exercise, five issues were identified as repeat findings from prior years (1987-1989). These issues involved: 1) the coordination of protective action recommendations at the EOF, 2) the failure to establish measures to control contamination within the TSC, 3) the ability of the TSC engineering staff to support the Control Room (CR), 4) the identification of inconsistencies in General Emergency class requirements in procedures used to classify emergency events, and 5) the potential missile hazard associated with storage of unsecured iodine monitors in the TSC ventilation room. The repeat findings demonstrated that the licensee did not have a corrective action program fully effective in preventing the recurrence of issues identified during drills, exercises, and NRC inspections. Once the repeat findings were identified by the NRC at the conclusion of the 1990 annual exercise, the licensee initiated a nonconformance report (NCR) to track the resolution of the matter. The licensee's actions in response to the NCR appeared thorough; however, the effectiveness of the licensee's corrective actions could not be determined since they were initiated toward the end of the SALP period. Additional findings from the 1990 exercise that indicated a decline in performance are discussed in subsequent paragraphs.

The inspections also showed that the licensee did not have sufficient procedural controls to govern the implementation of its drill program. As a result, some drills did not fully meet the scope of the emergency plan requirements. For example, radiological (environmental) monitoring drills were conducted, but environmental samples were not collected. Air samples were simulated during some inplant health physics drills and post accident sampling system drills were conducted, but samples were not analyzed.

As described above, one exception involving the effectiveness of the licensee's EP corrective action program was identified. The licensee's



approach to the resolution of technical issues from a safety standpoint was generally sound, thorough, and timely. Based on the CR's inability to demonstrate that offsite dose calculations could be completed in a timely manner to support emergency classification during the 1990 annual exercise, the licensee immediately initiated dose calculation training for onshift CR staff members and incorporated dose calculations into recurring operator training.

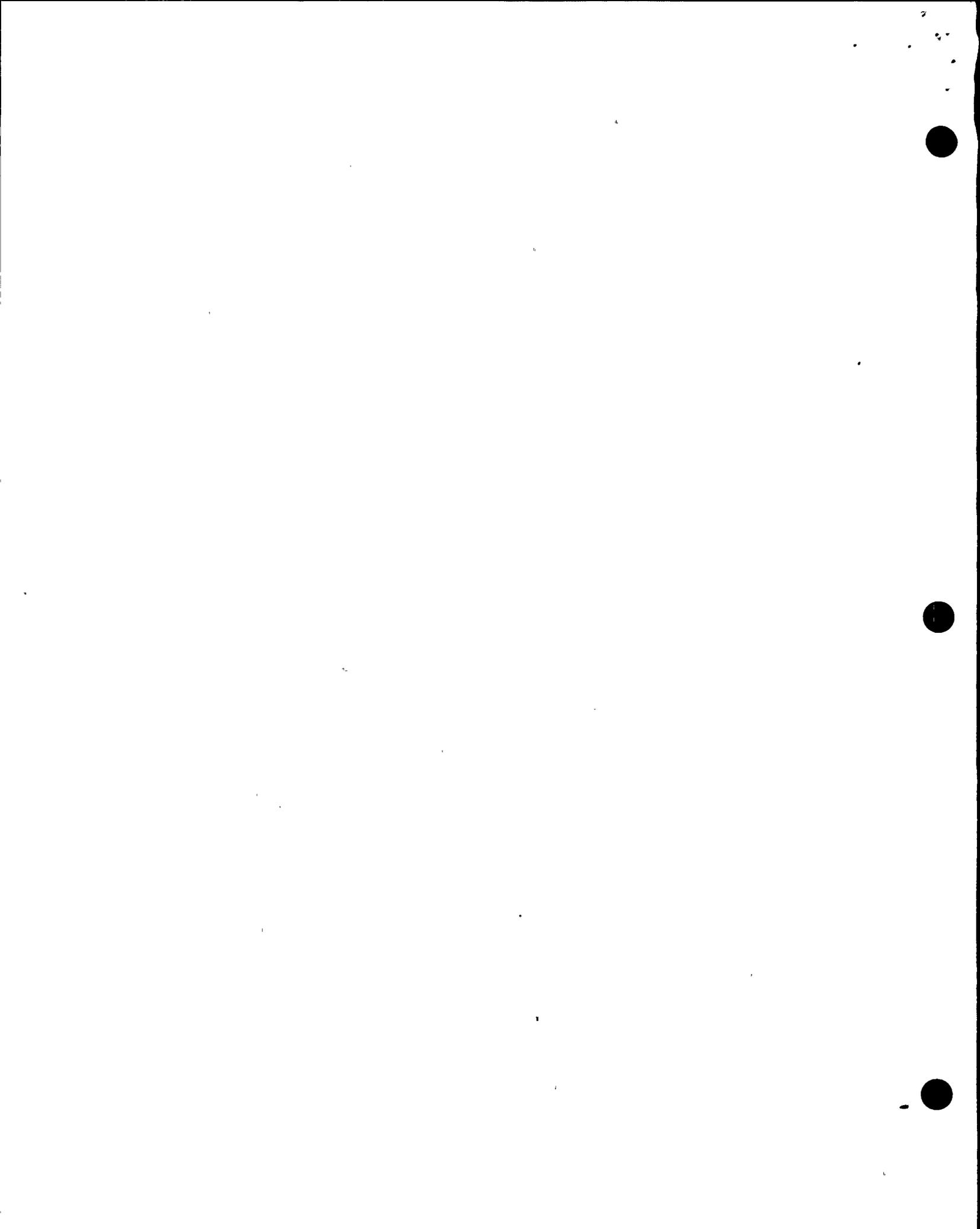
The licensee implemented its emergency plan on several occasions during this SALP period. All of the events were correctly classified as Unusual Events. The most notable example occurred as a result of the March 7, 1991, loss of offsite power during Unit 1's refueling outage. In general, all of the events were classified in a timely manner; however, the timeliness of the March 7, 1991, Unusual Event declaration was slow. Notifications to local offsite authorities were made in a timely manner.

Staffing for the EP program appeared sufficient during this SALP period. Due to rotational assignments and a reorganization, several changes have occurred in EP's management reporting chain at the site during the current SALP period. The licensee has established a new, permanent position to provide management oversight for EP, safety, and health. The management position above and the position below the newly established permanent position are considered to be rotational assignments. During this SALP period, the individuals in these two positions were changed due to a shift in rotational assignments. Both of the new individuals have strong EP backgrounds which should benefit the management of the EP program. Establishing the permanent position was viewed as a positive step to maintain stability. The effectiveness and continuity of the management could not be fully determined because two of the position changes occurred toward the end of the SALP period. Organizational changes to the emergency response staff (engineering support) at the EOF were made as a result of NRC concerns identified during the 1989 exercise.

Several weaknesses in the effectiveness of the licensee's EP training program were identified during this SALP period. The most significant example was the inability of the CR staff to complete dose calculations in a timely manner to support accident classification during the 1990 emergency exercise. Although the licensee took prompt corrective action, as previously described, the problems experienced during the exercise indicated that the previous level of training/practice was not adequate to accomplish the assigned responsibilities.

The weakness in the level of training/practice was also evident during the 1990 exercise as indicated by the findings discussed earlier and the observation that personnel from the Operations Support Center (OSC) did not fully adhere to radiation protection procedures during simulated emergencies. Toward the end of the SALP period, the licensee initiated steps to improve its EP training program. More drills were scheduled and drill/exercise findings will be incorporated into the training. The effectiveness of these actions could not be determined since they were initiated toward the end of the SALP period.

An in-office inspection was conducted to evaluate changes to the licensee's emergency classification procedure and the emergency action levels (EALs)



contained therein. A change to the Diablo Canyon emergency plan was also reviewed during this appraisal period. The changes to the emergency plan and EALs were acceptable and continued to meet NRC requirements. No cited violations or Licensee Event Reports were identified in this functional area during this appraisal period.

2. Performance Rating

Performance Assessment - Category - 2

3. Board Recommendations

Licensee management should ensure that an effective corrective action plan for drill and exercise findings is established and carried out. Licensee management should evaluate the adequacy of classroom training provided to emergency response personnel and ensure that personnel are given an adequate number of opportunities to practice their assigned tasks during periodic drills. The additional dose assessment training provided to CR personnel should continue. The need to adhere to radiation protection procedures under simulated emergency conditions should also be stressed during classroom training and during drill conduct. Administrative procedures should be enhanced to ensure that drills and exercises consistently meet emergency plan requirements. Simulating sample collection during drills and exercises should be avoided to enhance realism and increase the training value.

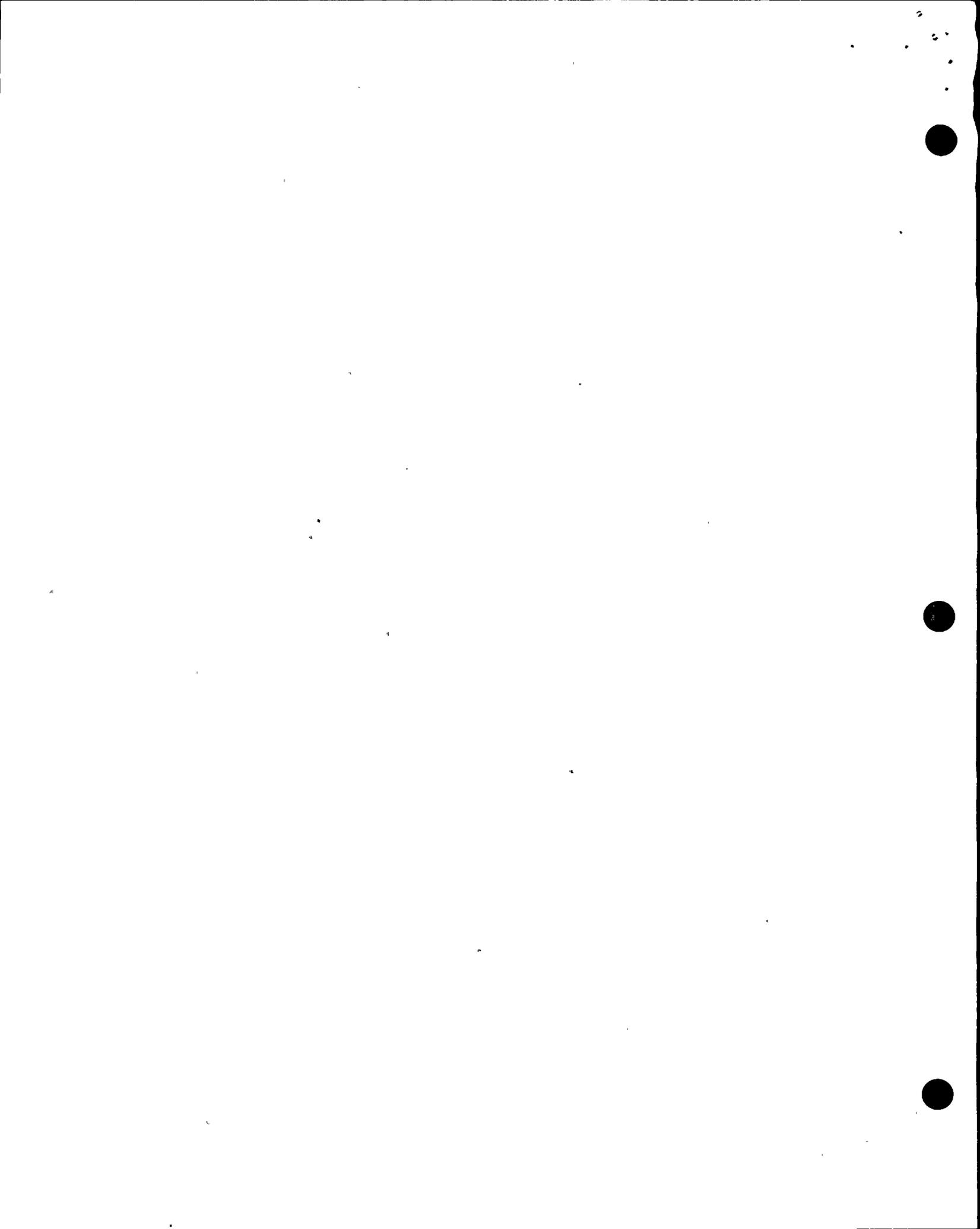
E. Security

1. Analysis

During this assessment period, Region V conducted three physical security inspections which comprised approximately four percent of the total inspection effort. In addition, Region V conducted one enforcement conference pertaining to an escalated enforcement action. Further, the resident inspectors provided continuing observations in this area.

The previous SALP report rated the licensee as Category 2, Improving, and recommended that licensee management resolve the identified weakness with the closed circuit television (CCTV) alarm assessment capability, plus finalize measures to correct identified inadequacies with portions of vital area barriers. As discussed below, these issues are scheduled for completion, or have been completed. During this SALP period, the licensee's weaknesses pertained to an escalated enforcement action that primarily focused on personnel access control to vital areas, plus additional enforcement actions involving failed compensatory security measures. The strengths identified this SALP period included the licensee's construction of a new Central Alarm Station, and their improvements related to strengthening the readiness posture of the security contingency response force.

The previous SALP report encouraged the licensee to resolve the identified weakness in CCTV alarm assessment capability, involving the manner in which the integrated security systems (barrier, perimeter alarms and CCTV cameras) are used. To resolve this weakness, the licensee has scheduled installation of a video-capture system by September 1991. This new system, in conjunction with the CCTV cameras and security alarms, should provide the capability for



instant assessment of the cause for perimeter alarms. The previous SALP report also encouraged the licensee to finalize measures to correct identified inadequacies with portions of vital area barriers at the Units' 1 and 2 pipe galleries. This action has been completed. The licensee's approach to the resolution of these two technical issues has been sound and thorough.

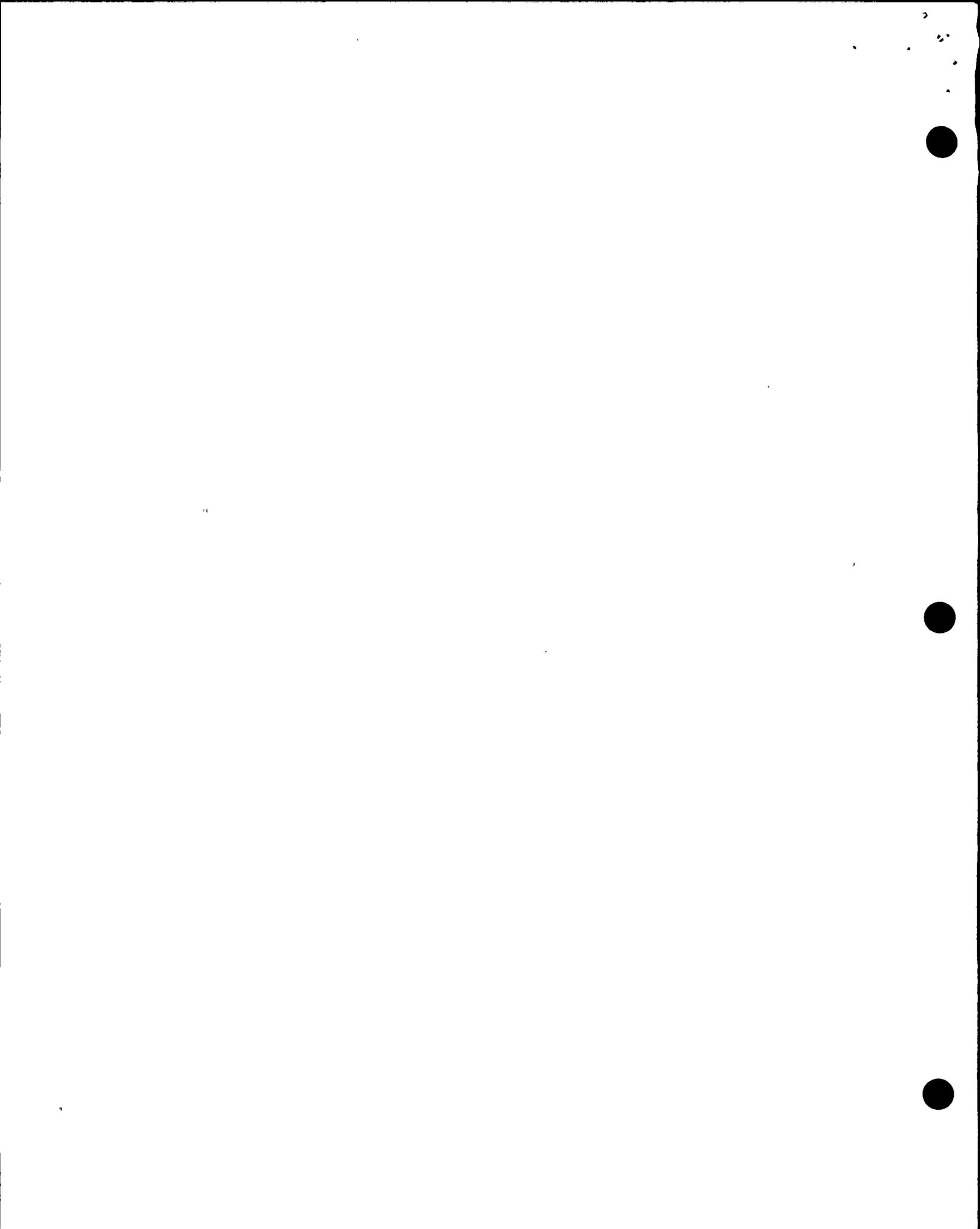
With regard to management's involvement in assuring quality, corporate and plant management continued to review the operation of the overall security program. They have implemented generally sound and thorough remedial measures to correct deficiencies and weaknesses identified in the course of both internal and NRC security inspections.

During this SALP period, the licensee reported seven incidents in which unauthorized employees had gained access to plant vital areas. In most of these instances, the unauthorized employee had been previously authorized access only to the protected area, and had entered the vital area based upon the card-key authority of another employee. The licensee's corrective actions have emphasized to plant employees the importance of following required procedures when seeking access to vital areas, thus the frequency of these incidents have been reduced by approximately 80 percent.

Additionally, multiple incidents of failed compensatory measures were identified by the licensee during this SALP period. In each instance, an officer had been assigned the required duty of monitoring a degraded piece of security equipment, and for one of several reasons, the equipment was not properly monitored. In two instances, the compensatory officer was discovered inattentive, and in other instances, the compensatory officer had either been provided inadequate instructions by his supervisor, or had been involved in a miscommunication with other members of the security force. The majority of these incidents involving failed compensatory measures occurred during the second half of the SALP period, and the overall effectiveness of the licensee's corrective actions have not been evaluated by the NRC.

During this period, the licensee's overall security program has been enhanced in several areas. A newly constructed Central Alarm Station provides an improved "nerve center" for security operations. The licensee's responsiveness to the design basis threat (10 CFR Part 73) has been increased through implementation of defensive choke-point positions, prepositioning of response equipment to expanded locations throughout the plant, and improved weaponry and uniforms for members of the security force. Additionally, the licensee effectively upgraded the capability of their security emergency power supply.

The enforcement history for this period includes issuance of one Level-III violation, four Level-IV violations, and ten non-cited violations. The Level-III violation, plus one Level-IV violation focused primarily upon the entry of unauthorized employees into plant vital areas. Two of the Level-IV violations, plus three of the non-cited violations pertained to situations of failed compensatory security measures. A separate portion of the aggregate Level-III violation, plus one non-cited violation pertained to situations involving the licensee's failure to properly protect safeguards information. In response to these enforcement actions, the licensee's corrective actions have been thorough and generally effective.



During the SALP period, each of the licensee's fourteen safeguards events were reported in the Licensee Event Report (LER) format. These events related to: failed compensatory measures(5); problems encountered with the security power system(3); and miscellaneous events(6). Nine (64%) of these safeguards events were caused by personnel errors and were attributed to causes under the licensee's control. The five LERs pertaining to failed compensatory measures were caused by: inadequate compensatory instructions to security officers, miscommunication between security personnel, and inattentive security officers.

During the previous SALP period, the greatest number of LERs pertained to degraded operation of the alarm stations, and Region V determined that the alarm station operators had been rarely observed during the performance of duty by their supervisors. To correct this situation, the licensee required each shift supervisor to visit both alarm stations once per shift. This appears to have improved the overall operation of the alarm stations.

Key positions and responsibilities within the Security Department were well defined. The licensee's security training program supported the overall increased readiness posture of the security force.

The licensee's Fitness-For-Duty (FFD) program appears to meet the requirements of 10 CFR Part 26. Though not formally inspected during this SALP period, reviews of required FFD reports plus informal reviews of FFD staff and facilities indicate that the FFD program is comprehensive and well understood by the general site population.

2. Performance Rating

Performance Assessment - Category - 2, Improving

3. Board Recommendations

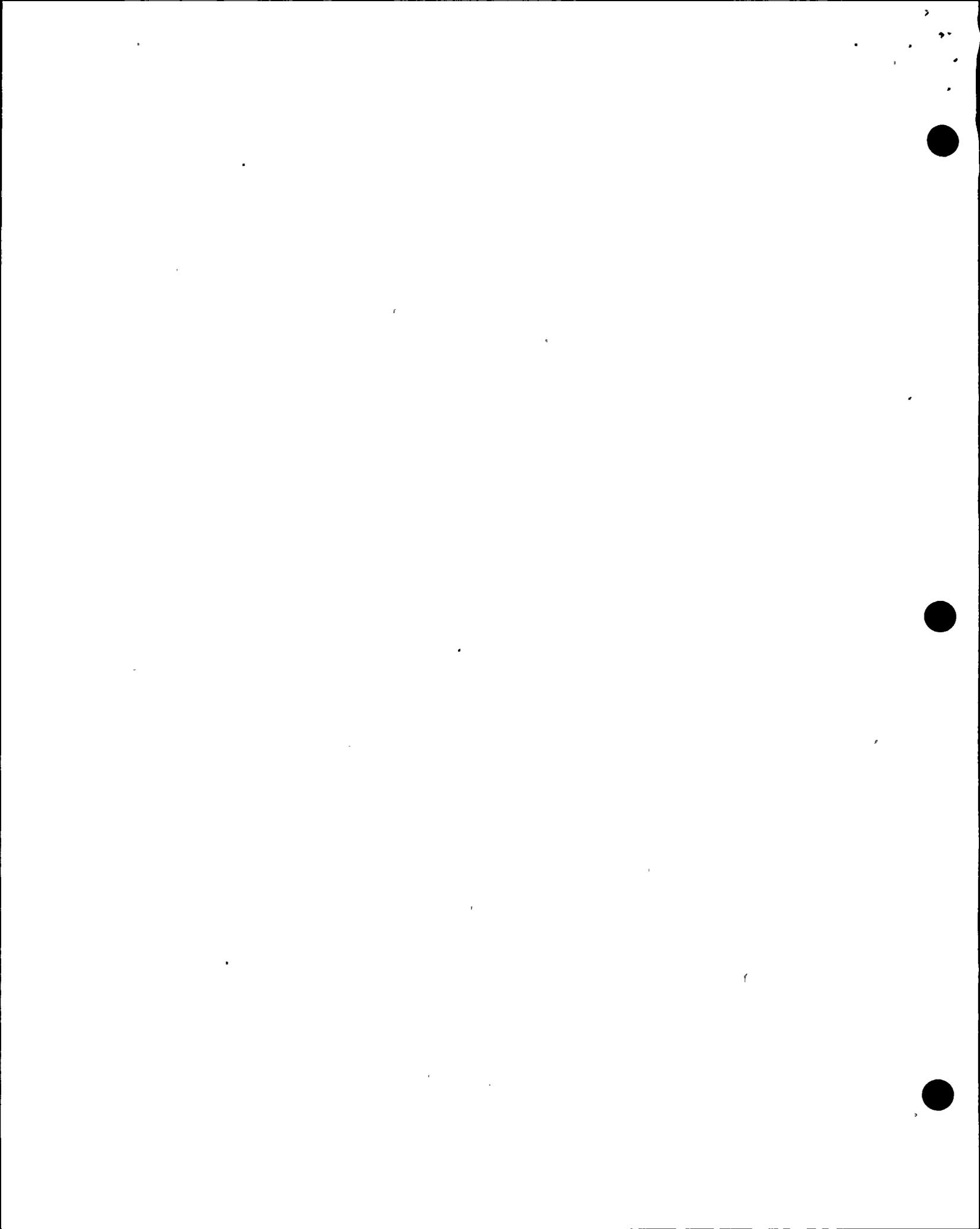
Licensee security management should reduce the number of situations involving failed compensatory security measures. Licensee management should emphasize adherence to site security procedures in order to reduce the types of enforcement actions and reportable events identified during this SALP period, or licensee management should implement other techniques for positive control over door entries.

F. Engineering/Technical Support

1. Analysis

This functional area was examined by regional and resident inspectors and was also examined by NRC headquarters evaluators. Approximately 18 percent of the inspection resources were used in evaluating this functional area.

The previous SALP rated licensee performance in this functional area as Category 2, Improving. The licensee was encouraged to place emphasis on the system engineering and configuration management programs and to focus on the formal resolution of plant problems. The licensee was also encouraged to be self-critical, to promote early identification of problems, and to establish aggressive schedules for corrective actions. The licensee received a specific



board recommendation to aggressively assess the issue of plant material condition.

Generally, during this SALP assessment period, engineering/technical support at Diablo Canyon has been very good in the areas where attention has been focused. Engineering involvement at the site has noticeably increased and has generally had a positive effect on operations and the quality of modification work. In addition, licensee management involvement shows consistent evidence of prior planning and assignment of priorities. Most engineering evaluations have been found to be technically adequate.

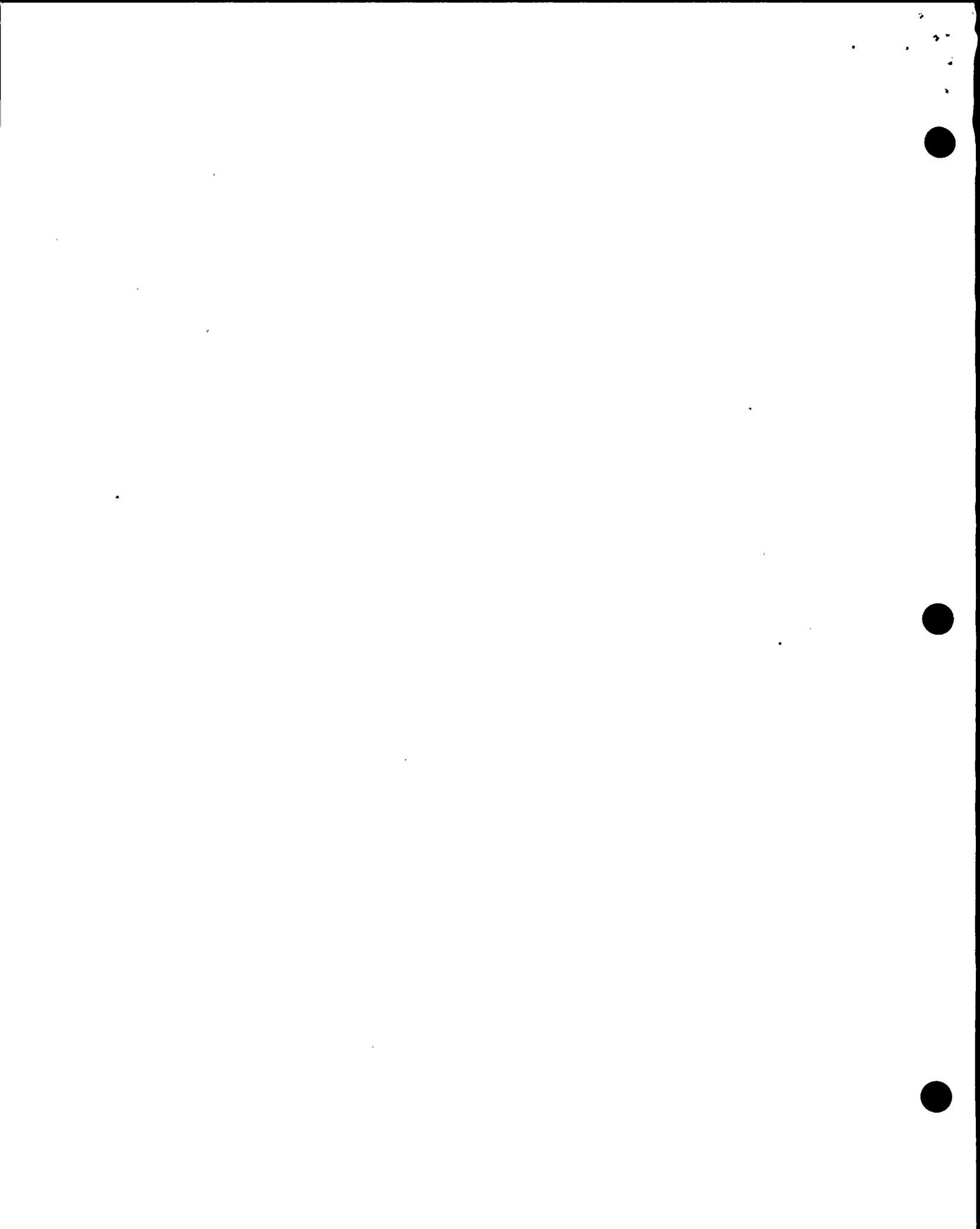
The licensee's design basis reviews were productive in identifying problems in the original construction. The licensee has been forthright in addressing these problems as nonconformances and dealing with them appropriately. One design problem that was quickly resolved involved a seismic concern regarding water that had not been drained from containment spray piping. Plant and corporate personnel worked closely together to resolve the problem. Likewise, corporate engineering's setpoint reverification program was productive in identifying problems with electrical thermal overload design margins throughout the plant.

Corporate engineering established a proactive program with Westinghouse to maintain up-to-date communications with Westinghouse's study of potential generic issues. This program enabled PG&E to respond to Westinghouse Part 21 reports very quickly. In addition there were cases where corporate engineering interest and involvement in long-standing plant problems resulted in comprehensive action and correction of problems. Such was the case in the investigation of breaking steam dump valves and in the case of determining why the steam admission valve to the auxiliary feedwater pump was sticking closed. Currently, the quality of engineering work on masonry walls is good.

Towards the end of the assessment period, an electrical distribution system functional inspection (EDSFI) was conducted. The inspection, conducted by NRC regional and headquarters staff members, found the engineering technical performance to be generally very good. In particular, the team found that the licensee had implemented a number of proactive measures to address problems at Diablo Canyon based on their own review of EDSFI findings at other facilities. Also, the team noted that Diablo Canyon had implemented an aggressive vendor interface program to maintain up-to-date information on equipment installed at the plant. The primary engineering weaknesses noted by the team involved several instances of incomplete technical work and a weak sense of ownership of some plant problems. This latter concern appeared to manifest itself in the form of a lack of timely identification and resolution of some problems.

Engineering personnel were found to be well qualified in a January 1990 team inspection of the corrective action program. The staffing levels, both at the site and in the corporate office are very good. The licensee is currently developing comprehensive training initiatives including a job task analysis for engineers.

Despite the previous observations, improvements can still be made in the thoroughness of engineering activities. One example involves a design change to remove the boron injection tank in Unit 2. The planned design change was aborted when licensee QA audits found that additional equipment qualification was required. Likewise, engineering exhibited other examples where work could



have been more thorough such as providing improper blowdown settings for Unit 2 relief valves, utilizing the wrong unit steam dump data for justification of a technical specification change, and providing inaccurate wiring schematics for a diesel generator droop relay design change. Some examples where engineering personnel did not always promptly assess site occurrences were observed. Equipment problems like motor operated valve spring pack relaxation, out-of-service hardware, and frequent alarms on the reactor vibration and loose parts monitor received little attention by responsible plant engineering personnel. Additionally, about 50 minor deviations to the licensing basis for fire protection have not been fully resolved.

The results of a Vendor Branch assessment of PG&E's procurement practices indicated that PG&E had made a significant effort to upgrade its commercial-grade dedication program since its inception in July 1986, and that their program description was generally consistent with the dedication philosophy described by the Electric Power Research Institute (EPRI). PG&E's engineering and technical support related to commercial-grade dedication was seen as a strength by the assessment team. Personnel related to the program were found to be knowledgeable and aware of current issues and concerns. PG&E's involvement in industry groups has benefited both the engineering staff and the overall commercial-grade dedication program. Especially noteworthy was the fact that PG&E's commercial-grade dedication program was initiated 16 months prior to the initiative commitment date of January 1, 1990. One negative aspect of the procurement and dedication program was that a licensee internal audit found that communication and interaction between site and corporate personnel appeared to be lacking.

During the SALP period, the NRR staff was involved in a number of in-depth reviews pertaining to engineering activities. Principal among these was the staff's review of the Long Term Seismic Program (LTSP). The material presented demonstrated thorough and comprehensive engineering analysis. Overall, the staff found that the geological, seismological, and geophysical investigations and analyses conducted by the licensee for the LTSP were the most thorough and complete ever conducted for a nuclear facility in this country and have advanced the state of knowledge. As part of the LTSP, the licensee developed a comprehensive, Level 1 PRA model for the plant which includes external accident initiating events such as fires and earthquakes, as well as internal events such as LOCAs. The engineering staff expects to use the PRA as a tool to assist the maintenance, operations, and planning organizations in scheduling outages and preventive maintenance activities.

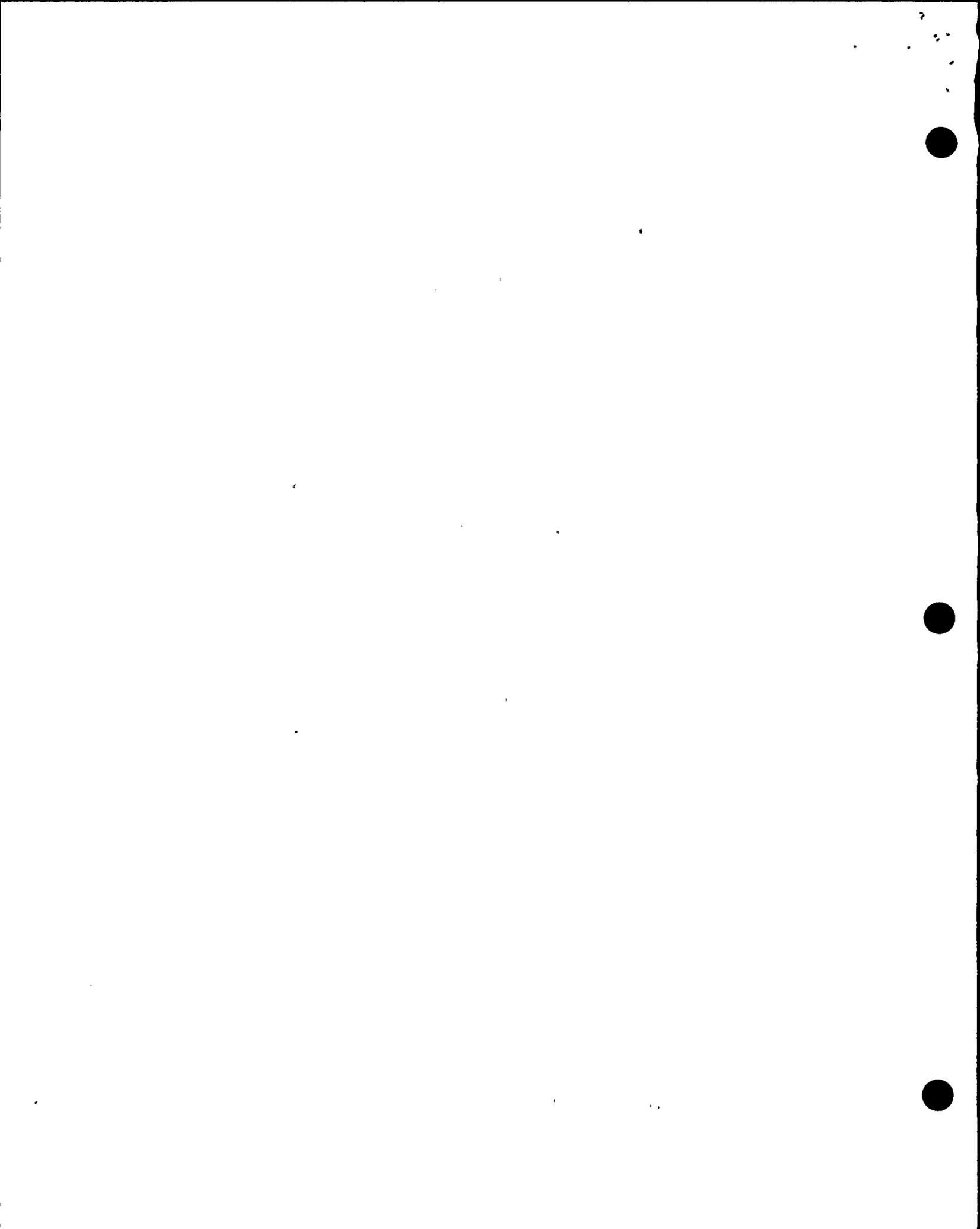
The violations and Licensee Event Reports associated with this functional area did not point to any single concern.

2. Performance Rating

Performance Assessment - Category - 1

3. Board Recommendation

The licensee should provide additional emphasis in early identification, effective engineering involvement, and timely correction of plant problems. The licensee should continue to build a strong interface between corporate and plant engineering and consider continued involvement of corporate engineering



in a leadership role in plant problem resolution. The licensee is encouraged to continue to develop their innovative corporate engineering training program.

G. Safety Assessment/Quality Verification

1. Analysis

Evaluation of this functional area was based on regional and resident based inspections. Eighteen percent of the NRC's inspection effort at Diablo Canyon was used in this functional area.

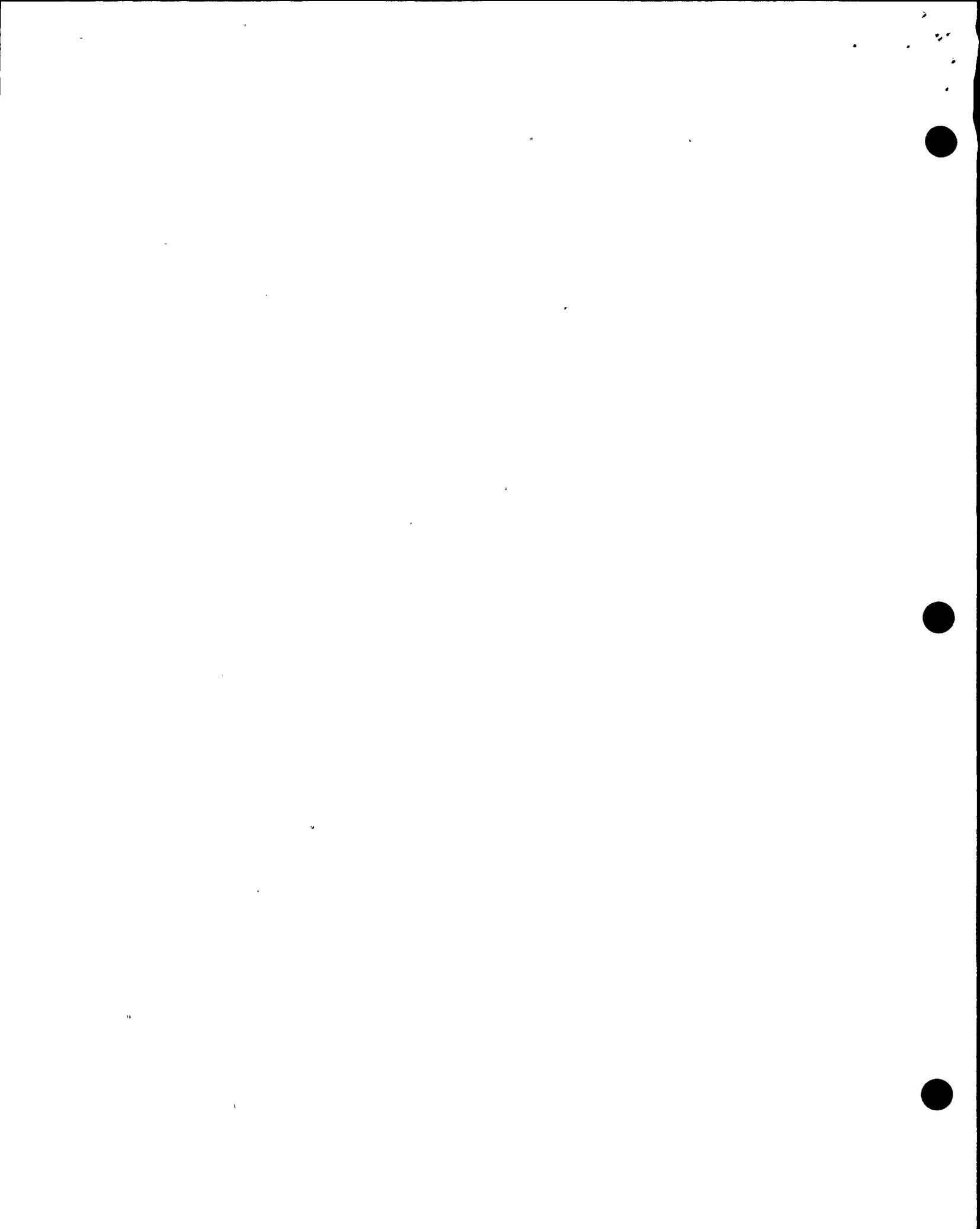
During the previous SALP period, this functional area was rated as Category 2, Improving. Licensee strengths in performance based Quality Assurance (QA) inspections were recognized. The Board recommendations encouraged the licensee to maintain emphasis on performance based audits and to increase emphasis on the identification of problems.

The general conduct of QA audits continued to be performance based and effective. When necessary, expert technical personnel were called in to augment the audit team. In addition, the licensee formulated a group called the Nuclear Excellence Team (NET) to evaluate problem areas as requested by senior management. One product of the NET was a meaningful examination of fire protection program implementation. The licensee has also demonstrated committed involvement and leadership in the area of industry initiatives.

During the SALP period the licensee reorganized the QA organization. The QA organization now reports directly to the Senior Vice President and General Manager for the Nuclear Power Generation Business Unit instead of the corporate President. No adverse effects from the QA reorganization were noted during the reporting period.

Near the middle of the SALP period, the Senior Vice President required that an event investigation team (EIT) be conducted to address NRC concerns related to the timeliness and ownership of actions following an auxiliary feedwater pump overspeed event and a weld crack in the positive displacement charging pump piping. The EIT concluded that the untimely problem resolution was caused by (1) a lack of problem ownership and (2) a lack of requirements for the allowed time to initiate a nonconformance report. The licensee implemented organization and procedural changes as a result of the EIT. These actions appeared to provide some improvement in the assignment of responsibility for multi-department problems. The licensee also began to monitor the time limits for nonconformance decisions. The decision level for nonconformance resolution was also elevated to the plant manager when necessary.

It was observed during the first part of the assessment period that organizations such as Quality Assurance, Quality Control, (QC) and the Onsite Safety Review Group performed little critical assessment of Operations. Problems identified by the NRC through the review of control room logs had been overlooked. In response to this assessment, Quality Control began to perform critical reviews of control room logs with some positive results. In the area of Radiological Controls, the licensee developed a program to perform thorough reviews of radiological protection using peer experts.



As discussed in the maintenance area of this SALP report, in one significant case when a problem area was recognized by oversight groups their actions to pursue and resolve the problem was not sufficiently aggressive. Such was the case when inadequate control of measuring and test equipment had been identified by both QC and QA but had not been resolved, even though the problem had been elevated to upper management.

In some instances, the licensee's organizations were slow to understand and solve repetitive component failures and problems. For example, steam dump valves have had internal failures since May 1990 and were not systematically addressed until May 1991. Likewise, letdown welds have been cracking in Unit 12 since June of 1989 and the root cause was not aggressively pursued and resolved until 1991. Finally, the repetitive NRC findings from Emergency Preparedness exercises also indicate the need to aggressively correct problems before they recur. Once the licensee's attention was focused on these problems, resolution appeared thorough and timely.

Licensee staffing in the quality oversight groups appears good. It was noted that the licensee utilizes outside expertise when determined to be necessary and has extended this policy to include a non-PG&E expert member on its General Office Nuclear Plant Review and Audit Committee (GONPRAC).

During this assessment period, it was observed that when the Vice President, Diablo Canyon Operations and Plant Manager was away from the site, a department head was designated to act as the Plant Manager. The effect of this was that department heads, with their specific areas of responsibility, may not have the broad scope perspective necessary when designated as acting plant manager. An example of this situation was the Maintenance Manager's decision to restart from the pressurizer spray valve event (on December 24, 1990) without fully investigating the problem.

During the SALP period the NRR staff reviewed a large number of safety analyses performed by the licensee. The licensee replies to generic letters and bulletins were timely, responsive, and of generally high quality. The submittals for licensee amendment requests were technically adequate and generally complete.

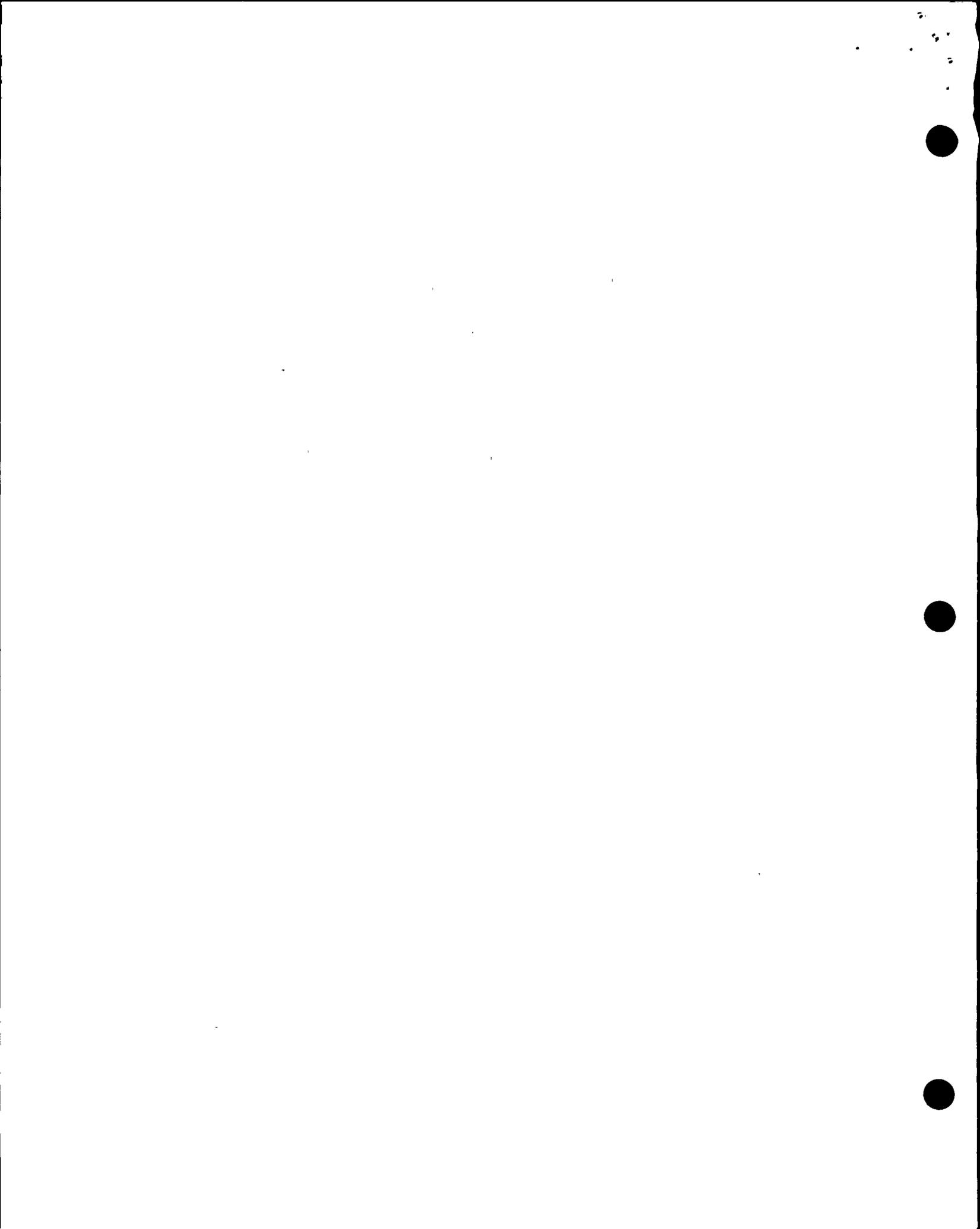
The most significant violation attributed to this functional area pertained to the control of mechanical maintenance measuring and test equipment. The Licensee Event Reports in this area did not point to any significant concern.

2. Performance Rating

Performance Assessment - Category - 1

3. Board Recommendations

The licensee should promptly deal with emerging technical issues to prevent them from affecting the plant as was the case with steam dump valve failures and cracking of charging piping. Management should involve themselves in timely resolution of outstanding issues to prevent the slow action that occurred in addressing concerns with measuring and test equipment. Increased attention should be focused on repeat problems.



IV. SUPPORTING DATA AND SUMMARIES

A. LICENSEE ACTIVITIES

UNIT 1

Diablo Canyon Unit 1 was at 100% power at the start of this reporting period. On February 6, 1990, an Unusual Event was declared when a moderate seismic event was detected, but an inspection of both units indicated no abnormalities.

On February 20, 1990, Unit 1 was manually tripped due to a loss of flow from both main feedwater pumps. Two logic cards from the SSPS were tested and replaced. The cause of this event was unknown. Unit 1 was returned to 100% power on February 22, 1990.

On June 14, 1990, Unit 1 tripped on a Power Range Nuclear Instrument high positive rate trip signal due to an increase in reactor coolant pump speed caused by a loss of load. Unit 1 entered Mode 1 on June 19, 1990.

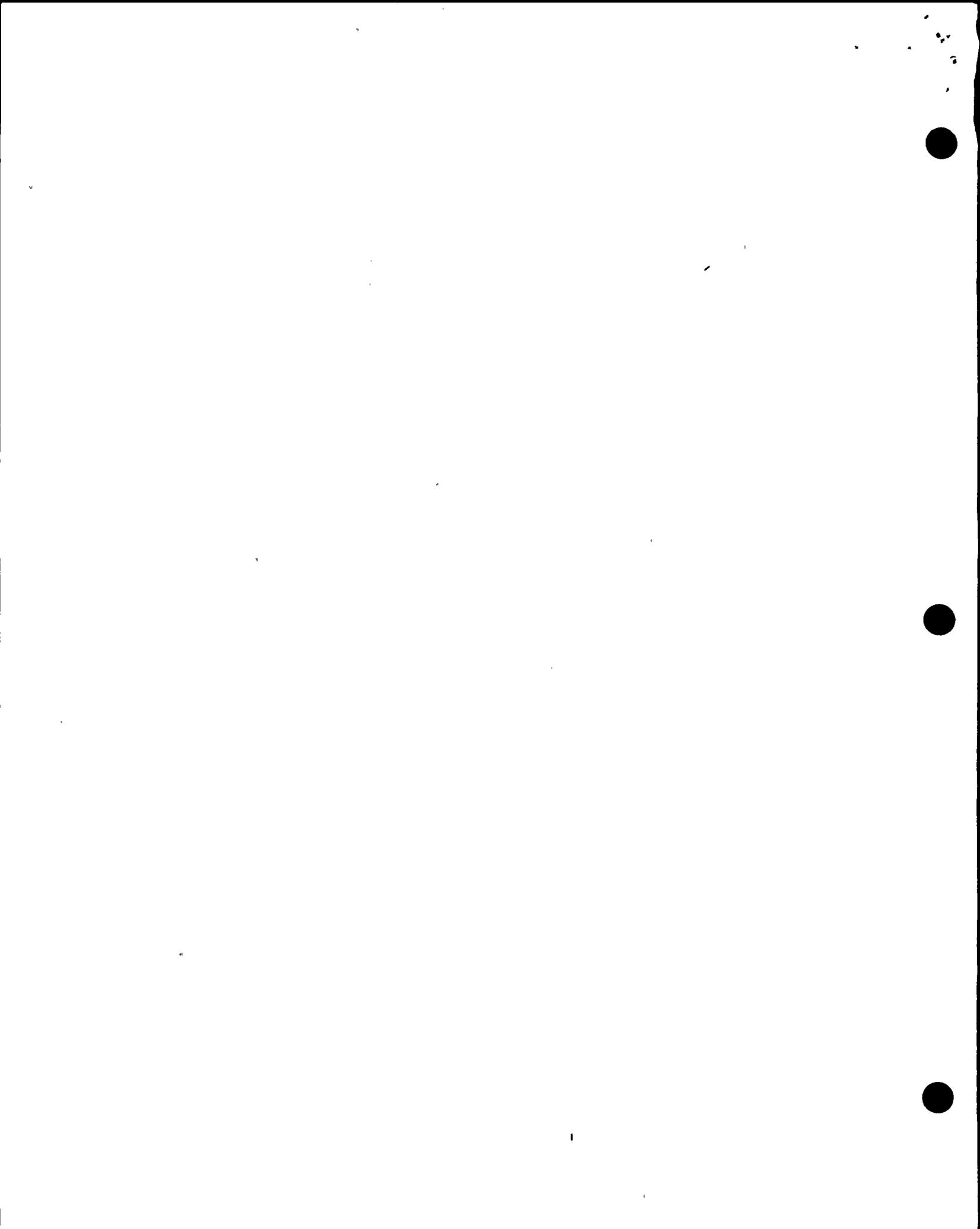
On July 26, 1990, the NRC Senior Resident identified a through wall crack on a four-inch diameter piping elbow, upstream of the suction stabilizer for the positive displacement charging pump. The licensee calculated that as a result of the crack, control room radiation doses could have exceeded the 10 CFR Part 50 requirements for control room habitability in the event of a LOCA. Compensatory measures were taken to allow continued operation, and a weld repair of the crack was performed on August 1, 1990.

On December 5, 1990, a reactor trip followed a turbine trip. The turbine tripped after a runback did not reduce generator load below a required limit. The licensee discovered that the runback limit setpoint was improperly set. The runback was caused by a stuck low flow switch for the main generator stator cooling water system. After repairs, Unit 1 returned to 100% power on December 9, 1990.

On December 24, 1990, an Unusual Event was declared after a reactor trip and safety injection occurred due to low pressurizer pressure, caused by the failure of a pressurizer spray valve. Following the reactor trip, the Technical Specification maximum cooldown rate of 100° F in one hour was exceeded. The pressurizer spray valve failed open due to the feedback linkage becoming disconnected because of a missing elastic stop nut. Failure of a main condenser steam dump valve also contributed to the overcooling. Following repairs, Unit 1 returned to power operation on December 28, 1990.

On January 18, 1991, Unit 1 commenced its End of Life (EOL) coastdown for the fourth refueling outage (IR4).

On February 1, 1991, the reactor tripped due to steam generator low level coincident with steam flow/feedwater flow mismatch after the feedwater regulating valves to two steam generators closed. This occurred when instrument air was accidentally isolated during scaffolding erection. On February 2, 1991, it entered Mode 5. On February 6, 1991, Unit 1 entered Mode 6 and fuel unloading commenced. On February 10, 1991, fuel unloading was



completed, and on March 6, 1991, Unit 1 re-entered Mode 6 and commenced refueling.

On March 7, 1991, a loss of offsite power to Unit 1 occurred when a mobile crane approached too closely to the 500 kV power lines, causing an arc to ground. Following the loss of offsite power, the emergency diesel generators started and loaded to the vital buses. Offsite power was restored five hours later. An Unusual Event was declared as a result of the loss of offsite power, and an NRC Augmented Inspection Team (AIT) investigated the event. Also on March 7, 1991, the fuel reloading was completed, and the reactor entered Mode 5 (cold shutdown) on March 12, 1991.

On March 27, 1991, Unit 1 entered Mode 4, and Mode 3 was entered on March 29, 1991. Unit 1 entered Mode 2 on April 2, 1991, and on April 4, 1991, entered Mode 1.

On April 23, 1991, a reactor trip resulted from a high steam generator level. The level transient was caused by a loss of the main feedwater pump 1-1 due to a speed controller failure. Operator action was required to mitigate an unanticipated primary cooldown due to a failed open main condenser steam dump valve.

On April 24, 1991, during a reactor startup, a manual reactor trip was initiated following a rod control urgent alarm. The alarm was due to a failed fuse in the rod control power supply. On April 25, 1991, Unit 1 re-entered Mode 1.

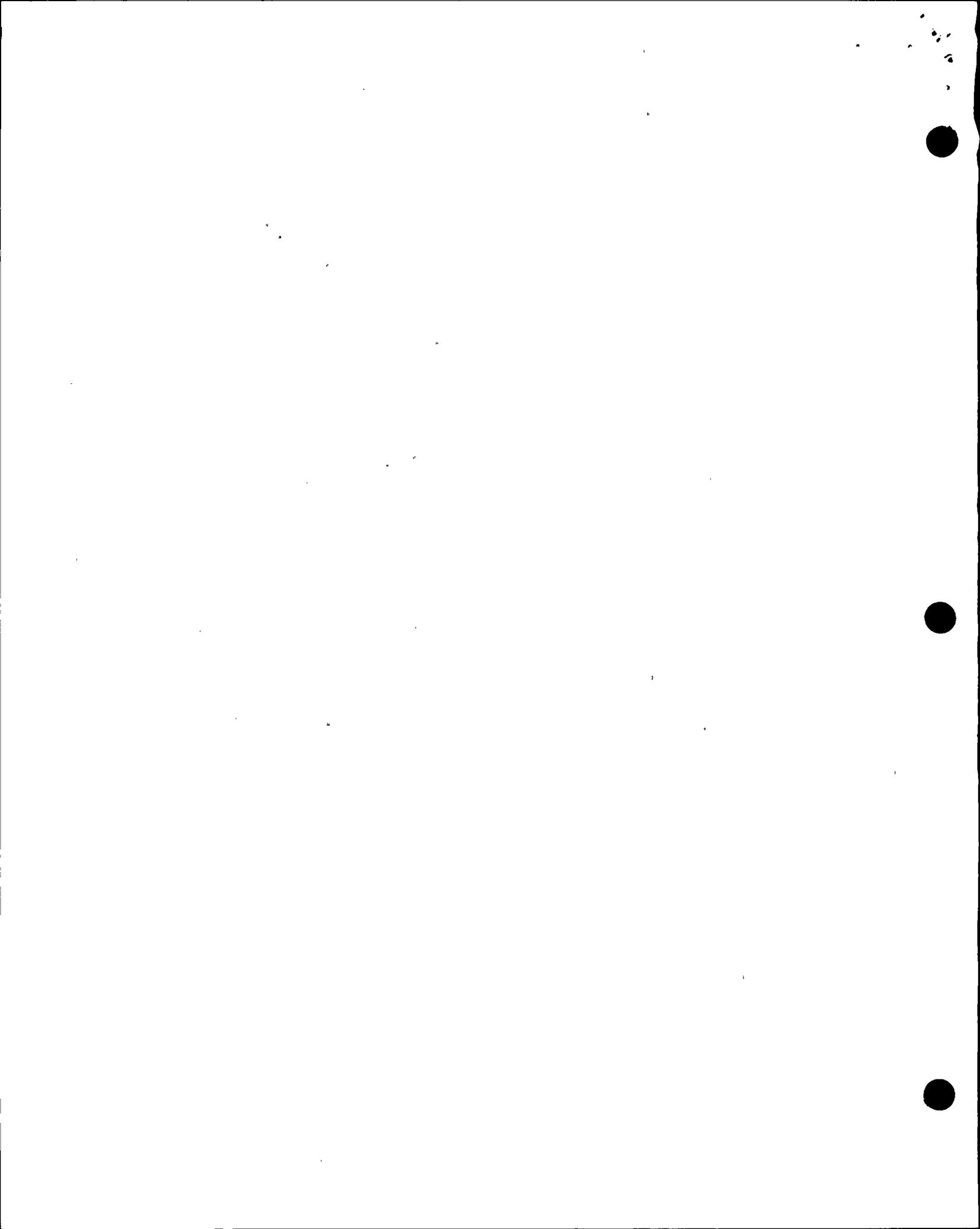
On May 17, 1991, a reactor trip occurred after an I&C technician inadvertently deenergized a second power range instrument while performing a surveillance test on a different instrument. Subsequent to the trip, two main condenser steam dump valves failed open, resulting in low pressurizer pressure and a safety injection. Additionally, the Technical Specification maximum cooldown rate of 100° F in one hour was exceeded. An Unusual Event was declared as a result of initiating safety injection. The unit returned to 100% power on May 21, 1991, and remained at power through the end of this assessment period.

Unit 2

Diablo Canyon Unit 2 was at 100% power at the start of this reporting period, and remained in Mode 1 until March 3, 1990, when it commenced a ramp down in power in preparation for the third refueling outage.

On March 9, 1990, Unit 2 entered Mode 6, and completed fuel off-loading on March 14, 1990. On March 26, 1990, Unit 2 re-entered Mode 6 and completed fuel reloading on March 31, 1990. On April 4, 1990, Unit 2 entered Mode 5, and on April 22, 1990, Mode 4 was entered. Unit 2 entered Mode 3 on April 23, Mode 2 on April 28, 1990, and on April 30, 1990, returned to power operation.

Unit 2 remained at power through the end of the assessment period, a record run of greater than 400 days at power.



B. Inspection Activities

Fifty-two routine and special inspections were conducted during this assessment period (January 1, 1990, through June 30, 1991). Significant inspections are listed in Section IV.B.2.

1. Inspection Data

Facility Name: Diablo Canyon Units 1 & 2, Docket numbers: 50-275 & 50-323, Inspection Reports: 89-33, 89-34, 90-01 through 90-09, 90-11 through 90-32, 91-01 through 91-14, 91-16 through 91-18, 91-21 and 91-23. Five of these reports summarized management meetings, two reports documented enforcement conferences, and one documented a meeting about the Quality Assurance program.

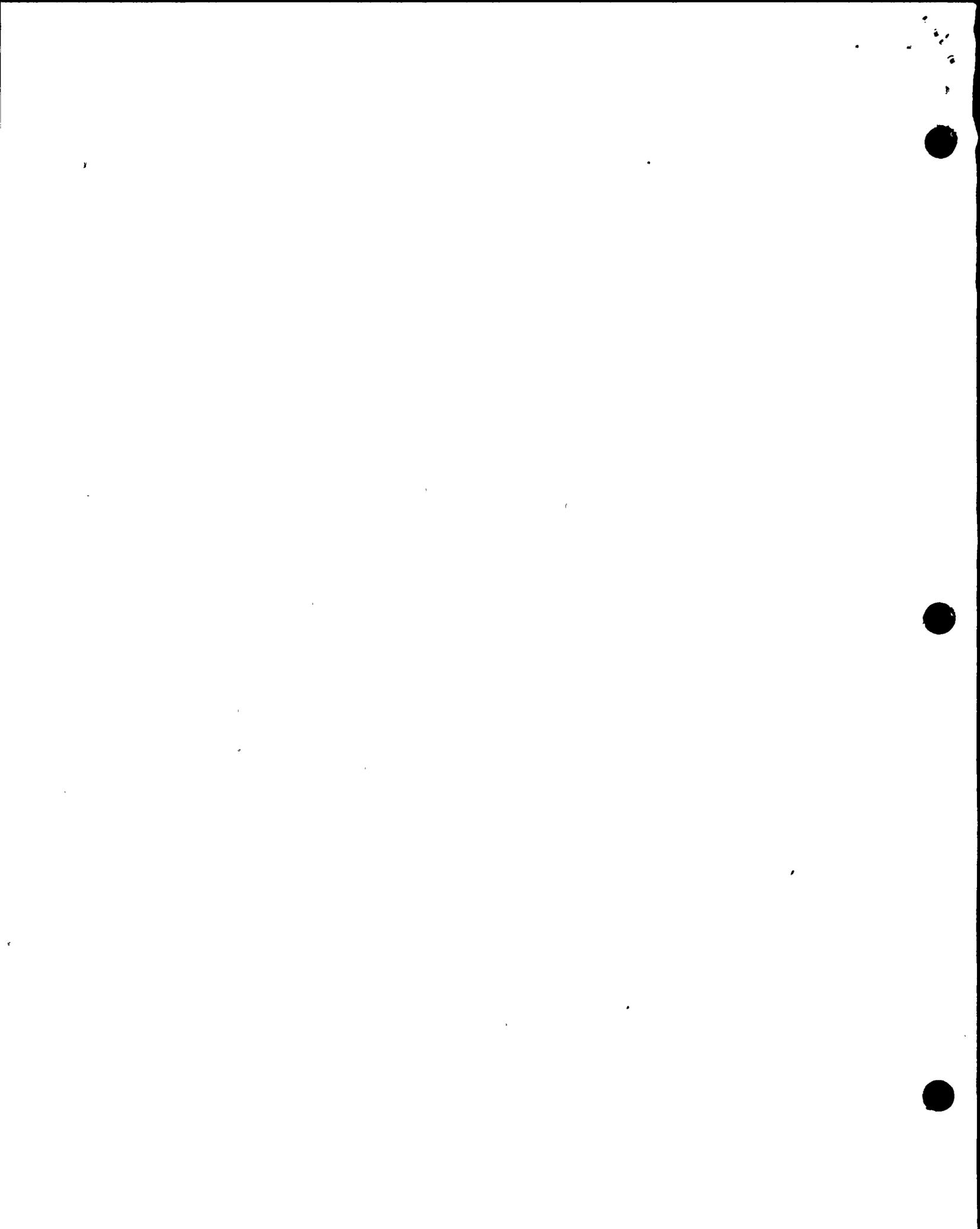
2. Special Inspection Summary

- a. From January 1 through February 2, 1990, a special inspection was conducted to assess the effectiveness of the licensee's corrective action program. (Inspection Report 50-275 & 50-273/91-01)
- b. From April 17 through May 25, 1990, a special inspection was conducted to review licensee activities in response to spring pack relaxation in Limitorque actuators for certain MOVs. (Inspection Report 50-275 & 50-323/90-16)
- c. From November 27, 1990, through January 11, 1991, a special inspection was conducted to review the licensee's mechanical maintenance measuring and test equipment program. (Inspection Report 50-275 & 50-323/90-29)
- d. From February 11 through February 14, 1991, a followup inspection was conducted to review the licensee's mechanical maintenance measuring and test equipment program. (Inspection Report 50-275 & 50-323/91-04)
- e. From March 8 through March 13, 1991, an Augmented Inspection Team (AIT) was formed to review the licensee's actions in response to the loss of offsite power to Unit 1. (Inspection Report 50-275 & 50-323/91-09)
- f. From April 22 through May 24, 1991, a special inspection was conducted to perform an electrical distribution system functional inspection. (Inspection Report 50-275 & 50-323/91-07)

C. Enforcement Activity

Unit 1

The inspections during this assessment period identified 16 cited violations, 1 deviation, and 13 non-cited violations. One of the cited violations was a Severity Level III with no civil penalty, and was issued for failing to prevent unauthorized access to vital areas, not properly recording entries into vital areas, and for failing to protect safeguards information (Inspection Report 50-275/90-02).



UNIT 2

The inspections during this enforcement period identified 4 cited violations, 1 deviation, and 1 non-cited violation. All of the cited violations were Severity Level IV.

D. Confirmatory Action Letters

None .

E. Licensee Event ReportsUnit 1 LERs

Unit 1 issued 49 LERs during this reporting period. The LERs were: 83-37, 83-38, 84-42 through 84-45, 89-15, 89-16, 89-17, 89-19, 90-01 through 90-07, 90-10, 90-12 through 90-15, 90-17 through 90-19, and 91-01 through 91-10 (91-10 was a voluntary LER). Fourteen security LERs were issued.

Unit 2 LERs

Unit 2 issued 13 LERs during this reporting period. The LERs issued were: 88-27, 89-11, 89-12, and 90-01 through 90-10 (90-08 was a voluntary LER).

