INITIAL SALP BOARD REPORT

U.S. NUCLEAR REGULATORY COMMISSION

REGION IV

SYSTEMATIC ASSESSMENT OF LICENSEE PERFORMANCE

Inspection Report 50-298/90-21

Nebraska Public Power District

Cooper Nuclear Station

April 16, 1989, through July 15, 1990

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 based upon 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 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 August 21, 1990, to review the observations and data on performance and to assess licensee performance in accordance with NRC Manual Chapter 0516, "Systematic Assessment of Licensee Performance." The guidance and evaluation criteria are summarized in Section III of this report. The Board's findings and recommendations were forwarded to the NRC Regional Administrator for approval and issuance.

This report is the NRC's assessment of the licensee's safety performance at the Cooper Nuclear Station for the period April 16, 1989, through July 15, 1990.

The SALP Board for the Cooper Nuclear Station was composed of:

Chairman

S. J. Collins, Director, Division of Reactor Projects (DRP), Region IV

Members

T. R. Quay, Acting Director, Project Directorate IV-1, Office of Nuclear Reactor Regulation (NRR)
T. P. Gwynn, Acting Deputy Director, Division of Radiation Safety and Safeguards (DRSS), Region IV
J. P. Jaudon, Deputy Director, Division of Reactor Safety (DRS), Region IV
P. O'Connor, Project Manager, Cooper Nuclear Station, Project Directorate IV-1, NRR
G. L. Constable, Chief, Project Section C, DRP, Region IV
W. R. Bennett, Senior Resident Inspector Cooper Nuclear Station

Other personnel who participated in all or part of the SALP Board were:

J. R. Johnson, Acting Deputy Director, DRP, Region IV
B. Murray, Chief, Facilities Radiological Protection Section, DRSS, Region IV
J. E. Gagliardo, Chief, Operational Programs Section (OPS), DRS, Region IV
W. C. Seidle, Chief, Test Programs Section, DRS, Region IV
D. A. Powers, Chief, Security and Emergency Preparedness Section, DRSS, Region IV

J. E. Cummins, Reactor Inspector, OPS, DRS, Region IV
G. A. Pick, Resident Inspector, Cooper Nuclear Station
R. V. Azua, Project Engineer, Project Section C, DRP, Region IV

II. SUMMARY OF RESULTS

Overview

The licensee's performance during this assessment period indicated a high level of management involvement and cooperation among the departments. Communication among all levels of the organization and between all departments was a strength. The material condition of the plant continued to be excellent. Although the program for control of maintenance was considered weak, it was noted that strong corrective actions were being developed but had not been fully implemented. The licensee had developed an excellent root cause analysis program. The one-on-one, on-the-job training of personnel at CNS contributed to excellent craft skills and performance.

The improvements that occurred in the functional areas of security, emergency preparedness, safety assessment and quality verification, and maintenance and surveillance indicate that CNS management and staff have been effective in improving performance. In safety assessment and quality verification, previously a SALP area of concern, significant action was taken to improve overall performance.

The SALP Board noted that there were significant training weaknesses manifested in several functional areas.

The licensee's performance ratings are summarized in the table below, along with the ratings from the previous SALP assessment period.

		Rating Last Period (02/01/88 to 04/15/89)	Rating This Period (04/16/89 to 07/15/90)	Trend
1.	Plant Operations	1	1	
2.	Radiological Controls	1	1	
3.	Maintenance/Surveillance	2	2	I*
4.	Emergency Preparedness	2	2	I*
5.	Security	2	2	I*
6.	Engineering/Technical Support	2	2	
7.	Safety Assessment/ Quality Verification	3	2	

*(I) Improving Trend - licensee performance was determined to be improving during the assessment period.

III. CRITERIA

Licensee performance was assessed in selected functional areas. Functional areas normally represent areas significant to nuclear safety and the environment.

The following evaluation criteria were used, as applicable, to assess each functional area:

A. Assurance of quality, including management involvement and control;

B. Approach to the resolution of technical issues from a safety standpoint;

C. Enforcement history;

D. Operational events (including response to, analyses of, reporting of, and corrective actions for);

E. Staffing (including management); and

F. Effectiveness of the training and qualification programs.

However, the NRC was not limited to these criteria and others may have been used where appropriate.

On the basis of the NRC assessment, each functional area evaluated was rated in one of the following three performance categories. The definitions of these performance categories are:

Category 1 Licensee management attention and involvement was readily evident and placed emphasis on superior performance of nuclear safety or safeguards activities, with the resulting performance substantially exceeding regulatory requirements. Licensee resources were ample and effectively used so that a high level of plant and personnel performance was being achieved. Reduced NRC attention may be appropriate.

Category 2 Licensee management attention to and involvement in the performance of nuclear safety or safeguards activities was good. The licensee had attained a level of performance above that needed to meet regulatory requirements. Licensee resources were adequate and reasonably allocated so that good plant and personnel performance was being achieved. NRC attention may be maintained at normal levels.

Category 3 Licensee management attention to and involvement in the performance of nuclear safety or safeguards activities was not sufficient. The licensee's performance did not significantly exceed that needed to meet minimal regulatory requirements. Licensee resources appeared to be strained or not effectively used. NRC attention should be increased above normal levels.

IV. PERFORMANCE ANALYSIS

A. Plant Operations

1. Analysis

This functional area consisted chiefly of the control and execution of activities directly related to operating a plant. It was intended to include activities such as plant startup, power operation, plant shutdown, and system lineups. Thus, it included activities such as monitoring and logging plant conditions, normal operations, response to transient and off-normal conditions, manipulating the reactor and auxiliary controls, plantwide housekeeping, control room professionalism, and interface with activities that support operations.

This functional area was inspected on an ongoing basis by the resident inspectors and periodically by region-based personnel. Included in these inspections was a followup to an emergency operating procedures (EOP) team inspection.

The licensee had 37 licensed senior reactor operators and 14 licensed reactor operators and maintained a six-shift operating crew rotation. Additional licensed personnel were available and normally performed functions to support plant operations. Examples of these functions included outage coordination, EOP development, and plant specific simulator development.

Concerns were identified in the area of training support for operations during this assessment period. Factors that are of concern include: operators performing at near minimum levels during the requalification exam, especially on the written examination; significant problems in test item development; and marginal resources used to achieve the required improvements to the existing examination question bank and develop the training program for the newly installed simulator.

Management attention in the area of plant operation was evident. Plant management made daily tours of the control room. Frequent tours were performed in the rest of the plant, including management tours on backshifts and on weekends. Daily conference calls were held between site and corporate management to discuss operation of the plant. A dedicated corporate manager was on call, via pager, to ensure support was available to plant management.

The plant operations staff performed in a conservative, professional manner throughout the assessment period. Control room distractions were minimized, and control room professionalism and decorum were evident throughout this

assessment period. Communications and cooperation among the operations staff and other plant groups were excellent.

During this assessment period, the licensee made additional hardware improvements to aid the operators. A computerized tagout system was implemented to minimize operator distractions; an effort was made to achieve a "black board" condition by implementing appropriate design changes, which greatly reduced the number of nuisance alarms; and a program was implemented to upgrade plant labeling.

The plant underwent four plant startups and one normal plant shutdown during this assessment. The licensee routinely took extra time to discuss actions and expected plant responses resulting from these mode changes. A management representative was routinely in the control room during all plant startups. No management pressure to hasten events during startup was ever observed.

There were two automatic scrams during the assessment period. One resulted from a spurious actuation of a turbine DEH (digital electrohydraulic) tank low level switch causing a turbine trip. The other was a loss of instrument air as a result of an air dryer postfilter failure. During both scrams the plant responded as designed. The licensee's response to both scrams was effective in determining root cause and required corrective actions.

The operators' response to the scrams was excellent as was their response to other plant perturbations. An example of operator responsiveness occurred when a Reactor Feed Pump (RFP) B minimum flow alarm was received and operators noticed that both RFP B turbine speed and reactor water level were decreasing. Operators immediately attempted to increase RFP B turbine speed manually. When this was not possible, the operators decreased reactor recirculation (RR) pump flow. However, when flow could not be decreased fast enough, they tripped one RR pump and restored the level using RFP A in manual control. These actions prevented a reactor scram and subsequent challenge to the plant.

Late in the assessment period, two isolated examples of personnel error or poor judgement were observed; these examples were atypical of past operator performance. The first occurrence was an operator positioning breakers out of the normal switching order, contrary to the applicable procedure, despite the presence of a sign on the panel warning the operator of the consequences of operating these breakers out of order. The second example was the failure of operators to stop performance of a surveillance which increased the torus temperature, even though the torus temperature was approaching the point which required manually scramming the plant. The torus temperature reached

109°F during the surveillance; Technical Specifications (TS) require a manual scram at 110°F torus temperature. Because the corrective actions were appropriate and the events were isolated, these examples did not raise generic concerns.

The EOP followup inspection resulted in the closure of 3 unresolved items and 21 other items discussed in NRC Inspection Report 50-298/88-200. The licensee demonstrated an appropriate awareness toward operational safety while resolving these items in a timely manner. Two items were undergoing further review. The licensee was in the process of updating the EOPs to Revision 4 of the Boiling Water Reactor Owner's Group Emergency Procedure Guidelines. It appeared that the licensee's approach to EOP development and the change from a text format to a flowchart format would result in comprehensive, easy-to-follow EOPs that would minimize chances for operator error. Training on Revision 4 to the EOPs had commenced on the simulator.

Housekeeping and material condition of the plant have consistently been excellent throughout the assessment period. These practices demonstrated the pride that both management and staff took in the plant.

In summary, the operations staff conservatively and safely operated the plant throughout this assessment period. Transients and events were handled in a manner that ensured maintenance of plant safety and integrity. The licensee continued to make hardware improvements to aid operator performance. Concerns were identified in the area of operator training.

2. Performance Ratings

The licensee is considered to be in performance Category 1 in this functional area.

3. Recommendations

a. NRC Actions

Inspection effort in this functional area should be consistent with the fundamental inspection program with an emphasis on assessing training effectiveness and monitoring implementation of the revised EOPs.

b. Licensee Actions

Licensee management should make efforts to address the causes of weaknesses in the areas of training support and training effectiveness. Licensee management should assess the personnel errors observed late in the assessment period.

B. Radiological Controls

1. Analysis

The assessment of this functional area consisted of activities related to radiation protection, radioactive waste management, radiological effluent controls and monitoring, radiological environmental monitoring, water chemistry controls, and transportation of radioactive materials.

The radiation protection program was inspected on an ongoing basis by the resident inspectors and on three occasions by region-based personnel.

The radiation protection staff was small when compared to other single unit plants; however, the radiation protection staff provided excellent support for routine plant operations. Contractor radiation protection technicians were used to supplement the permanent staff during major outages, but the licensee did not rely on contract personnel for normal plant operations. A stable staff was maintained because of the low turnover rate.

The licensee implemented the approved training and qualification program for radiation protection personnel at the technician level. Improvements could be made, however, to upgrade the training and qualification program in several areas. A formal training program had not been established for professionals and supervisors. A full-time training coordinator had not been designated to coordinate training activities with the training department. The training department instructor responsible for conducting training for the radiation protection staff did not have a good inventory of basic reference material related to the radiation protection area, e.g., a copy of the proposed revision to 10 CFR 20, NRC regulatory guides (NRCGs), and industry standards. One instance occurred during the 1990 refueling outage where an unqualified contractor was placed in a senior radiation technician position.

The radiation protection program received strong support from plant management and other departments. The corporate office did not include a group that provided technical support to the onsite radiation protection department; therefore, the plant organization was responsible for implementing the entire radiation protection program. The organization did not contain an individual with a strong technical background in power plant health physics along with extensive expertise and experience in power reactor radiation protection matters to provide technical support and backup to the radiation protection manager. Licensee management had approved a technical advisor position and a recruiting effort was under way to fill the position at the end of the assessment period.

Management involvement was evident by the performance of quality assurance (QA) audits and surveillances. The audits and surveillances covered several program areas, but the individuals performing the audits and surveillances had only limited technical training and experience in power plant health physics. The audits did not include suggestions for program improvements or comments as to the technical adequacy of the program. The next internal audit, scheduled for October, was to utilize a technical assistance exchange program. Radiation protection supervisors and foremen had increased the amount of time spent at job sites overseeing work activities.

The ALARA program continued to achieve low person-rem results. The collective dose for 1989 was 342 person-rem. The 1990 exposure through July 15, which included an outage period, was 320 person-rem. The licensee's annual average between 1986-89 was 249 person-rem reflecting a low collective dose. The ALARA program received excellent support from other plant groups. Examples of this support were the maintenance of fuel by the operations department and the excellent water chemistry program. Mockup training and videos of previous outage work were used as part of the ALARA training program during the 1990 refueling outage. The ALARA group was provided adequate time to review planned design changes and maintenance work requests. Good coordination existed between the ALARA group and the groups responsible for initiating plant changes and performing the maintenance work. The plant also maintained good housekeeping practices, which assisted the ALARA program.

A number of detected skin contamination events were identified on workers exiting the radiation controlled area (RCA) during the assessment period. The number of contamination events decreased in 1990 compared to 1989, but this area required continued attention. The licensee was investigating the cause of the events and was taking steps to correct the problem. The root causes of the events appeared to be the lack of training, the failure of personnel to follow proper work practices, and an increase in detection instrumentation sensitivity. The licensee implemented an extensive decontamination effort in order to reduce the amount of plant space previously designated as contaminated areas.

A single RCA was recently established to replace the previous individual controlled work areas. However, the new RCA appeared rather cumbersome and final survey procedures had not been established for tools and equipment leaving contaminated work areas. Several designated eating and smoking areas were located in the RCA; this could present problems regarding proper radiological control for these areas. This question was under evaluation by the licensee at the close of the assessment period.

The radioactive waste management and radioactive effluent control and monitoring programs were inspected once during the assessment period. The performance for this functional area continued to be effective. Liquid and gaseous release permit procedures had been implemented to assure that planned releases to the environment received proper review and approval prior to being released. The quantities of radionuclides released were within specified limits. The calculated offsite doses were also within regulatory limits. No unplanned releases occurred during the assessment period and no design changes were made to the radwaste systems. Semiannual effluent release reports were submitted in a timely manner and contained the required information. A well qualified staff had been maintained to handle the workload in this area. Management involvement was evident by the performance of comprehensive QA audits and surveillances.

The radiological environmental monitoring program was inspected once during the assessment. All environmental samples were collected and analyzed as required. An effective meteorological monitoring program had been maintained with an annual data recovery rate of greater than 90 percent. The Offsite Dose Assessment Manual had been revised to reflect changes made concerning new environmental sample locations. The Annual Radiological Environmental Operating Reports were submitted as required and contained the specified information. The onsite and corporate organizations responsible for implementing the environmental program included an adequate number of experienced personnel. Some on-the-job training had been provided to the onsite personnel involved with sample collection, packaging, and shipping. Additional training material was developed for the onsite group, but the training had not been presented. A formal training program had not been established for corporate individuals assigned to manage the program. Comprehensive QA audits of the environmental program were conducted. These audits also included reviews of the offsite vendors that performed radiological analyses of the licensee's environmental samples.

The water chemistry program was inspected once during the assessment. An excellent water chemistry program had been maintained since initial reactor startup and the licensee's performance continued at this level during this assessment period. Chemistry control limits had been established in accordance with General Electric fuel warranty specifications and Electric Power Research Institute (EPRI) guidelines for boiling water reactors. An aggressive chemistry control program was evident by the infrequency of chemistry parameters exceeding control limits. The water chemistry program also contributed in preventing the buildup of in-plant radiation levels which proved

to be an asset for the ALARA program. The water chemistry program included good implementing procedures and a well-qualified staff.

The transportation of radioactive materials and solid radioactive waste processing programs were inspected twice during the assessment. Procedures had been established that addressed such areas as waste classification and characterization, procurement and selection of packages, preparation of packages for shipment, and delivery of the completed packages to the carrier. An adequate staff had been assigned to handle these programs. No problems were identified.

In summary, the radiation protection program was well managed and received good support from plant management and other departments. The licensee performed in an excellent manner when handling day-to-day radiological controls. Excellent lines of communication existed between the radiation protection department and other departments. Progress was accomplished in reducing the contaminated areas in the plant. The water chemistry radiological environmental monitoring, and radioactive waste management programs were of high quality.

2. Performance Rating

The licensee is considered to be in Performance Category 1 in this functional area.

3. Recommendations

NRC Actions

Inspection effort in this functional area should be consistent with the fundamental inspection program with a special emphasis on the review of the licensee's training programs.

Licensee Actions

Management attention is needed to assess the training programs in this functional area. The QA audit team responsible for reviewing the radiation protection program should include a person with a strong background in health physics.

C. Maintenance/Surveillance

1. Analysis

The assessment of this area included all activities associated with either diagnostic, predictive, preventive, or corrective maintenance of plant systems, structures, and components; procurement, control, and storage of components, including

qualification controls; installation of plant modifications; and maintenance of the plant physical condition. It also included the conduct of all surveillance testing activities as well as all inservice inspection/inservice testing (ISI/IST) program and calibration program activities.

This functional area was inspected on an ongoing basis by the resident inspectors and periodically by region-based personnel. Also, a maintenance team inspection (MTI) was performed.

Improvements in the maintenance and surveillance programs had been made during this assessment period. The licensee devoted many resources to improving maintenance procedures, developing a predictive maintenance program, and correcting weaknesses identified by the MTI.

The material condition of the plant continued to be very good. The licensee's staff demonstrated a strong dedication to the organization and involvement in operations of the facility. The licensee exhibited excellent internal communications and involvement at appropriate levels of management in maintenance activities. Plant management was always aware of plant and system status, and maintenance craft consistently kept first-line supervisors well informed. The system engineering department was involved in all phases of maintenance

The level of detail in maintenance procedures and the large number of activities conducted using "skill-of-the-craft" guidance was identified as a weakness in the last SALP. In response, the licensee developed new maintenance procedures and revised existing maintenance procedures. The safety review group (SRG) performed independent procedure reviews and provided technical details for improvement. Additional reviews were performed by shop personnel who would be implementing the procedures. The licensee developed a procedure feedback form to be used to revise existing procedures when improvements were identified during procedure implementation. Approximately six feedback forms per month had been generated since implementation of the program.

Many maintenance activities, especially troubleshooting, continued to be performed utilizing "skill-of-the-craft" as guidance; however, the skill and knowledge of the craft prevented major problems from occurring. The licensee was revising the maintenance work control procedures to provide additional written guidance on development and implementation of special instructions for unusual maintenance activities with no existing procedures.

The licensee continued to implement the procedure rewrite program to improve procedure quality. Effectively 100 percent of the TS-required surveillance procedures and 96 percent of the maintenance procedures had been upgraded to conform with the plant specific writer's guide.

The licensee's program for calibration of instruments identified in the TS was found to be comprehensive and thorough. There were, however, examples of the licensee failing to calibrate instruments not specifically identified in the TS. Although the licensee took prompt corrective action, there was an additional example noted, which was not identified by the licensee's corrective action plan. Other inspections involving corrective actions in response to inspection findings and equipment malfunctions found the licensee's efforts to be both prompt and conservative.

The last SALP identified that the licensee had no effective predictive maintenance program. During this assessment period, the licensee used predictive maintenance techniques; however, no formal program was established. The techniques included thermography, oil analysis, and vibration monitoring. The licensee was in the process of developing a predictive maintenance program. Additionally, the nuclear engineering department was developing a reliability monitoring performance program for plant equipment. As part of the program, during this assessment period, the licensee installed vibration monitors for the recirculation pump and motor and for the high pressure coolant injection pump and turbine.

The MTI, conducted November - December 1989, identified significant weaknesses in the licensee's maintenance program. These weaknesses included inadequate prejob planning, work instruction, and procedures; insufficient control of work activities; inconsistent postmaintenance testing; safety precautions not taken; no well defined nor understood method for control of locked/sealed valves; and poor documentation of accomplished work activities. Many of the weaknesses reflect the licensee's ongoing problem with striking a proper balance between the adequacy of procedures and documentation and reliance upon craft knowledge and work practices. In addition, the MTI identified instances where the licensee failed to assure that unqualified and nonconforming materials, parts, and chemicals would not be installed or introduced into the plant.

A subsequent MTI followup inspection verified that the licensee was taking aggressive corrective action not only to the identified weaknesses but to improve the overall maintenance programs. Efforts were in progress to integrate information data bases to implement a more proactive and predictive maintenance program. The licensee had contracted consultants to

assist in this integration process and to evaluate/recommend actions to improve the root cause analysis program as well as prejob planning and quality control (QC) guidance.

A subsequent inspection of postmodification testing found that the program was technically sound, well controlled, and effectively implemented.

Although it was too early in the licensee's corrective action process to assess the overall effectiveness of the licensee's measures at the end of this appraisal period, there was a concerted effort to focus resources to improve the maintenance program.

The licensee's surveillance program was considered to be a strength. The surveillance schedule consistently reflected planning and assigned priorities. Program procedures for control of activities were well stated, controlled, and explicit. This was evidenced by a lack of missed or overdue surveillance tests; however, two exceptions occurred at the end of the assessment period. The licensee determined the root causes to be personnel error and a deficiency in the computer program for scheduling.

The surveillance procedures continued to be upgraded. The improved procedure format contributed to the prevention of personnel errors during performance of surveillance tests. The surveillance procedures had attributes such as: readability, understandable step-by-step instructions, and the necessary independent verifications. A minor problem identified concerned the connection of electrical test equipment to the wrong test jacks because of a procedural deficiency. To prevent further occurrences, the licensee reviewed TS-required surveillance procedures and identified 60 which required upgrading to specify the proper terminals.

Personnel conducting surveillances were well qualified. Senior technicians and senior operations personnel constantly challenged the knowledge of less experienced employees to assure successful testing. During surveillance performance, the licensee's staff demonstrated excellent communication and coordination.

The plant staff and management followed a conservative operating philosophy throughout the assessment period. When components failed or operated improperly, the licensee promptly resolved the problem utilizing thorough and technically sound approaches. Management involvement was demonstrated when a residual heat removal (RHR) valve indicated that it was in an intermediate position after the valve had been stroked as part of the RHR valve operability test. Engineering developed a special test procedure (STP) to verify that the valve was seated and to confirm RHR system operability. The onsite review committee

prepared a justification for continued operation (JCO) which required performing the STP after each operation of the valve.

The licensee was found to have adequate programs for ISI/IST, piping restraints, and the piping support qualification program. Further, licensee activities related to the measuring and test equipment calibration program appeared to be well controlled and effectively implemented. One weakness identified related to a failure of the ISI program to meet one element of Section XI of the ASME code.

Key staff positions were identified and well defined. The licensee increased the size of the mechanical, electrical, and instrument and control staffs during the assessment period. The licensee staff was well qualified and had a low turnover rate. During the refueling outage, the licensee hired qualified contractors to support installation of design changes.

The maintenance department added three engineers to provide support for programmatic maintenance activities. One of the maintenance department engineers was assigned to manage the predictive maintenance program.

In summary, during this assessment period, the licensee had effective programs to ensure that qualified personnel performed maintenance and surveillance activities as required. Coordination and cooperation among the licensee departments ensured that testing and maintenance activities were effectively accomplished. No engineered safety features actuations or plant scrams occurred as a result of surveillances performed. Although the licensee appeared to improve control of maintenance activities, the significant weaknesses in work control practices identified by the MTI had not been completely corrected.

2. Performance Rating

The licensee is considered to be in Performance Category 2 in this functional area. The licensee's performance was determined to be improving during this assessment period.

3. Recommendations

a. NRC Actions

Inspection effort in this functional area should be consistent with the fundamental inspection program. Regional initiative should include an inspection to further evaluate corrective actions in the maintenance work control program.

b. Licensee Actions

The licensee should continue to implement predictive maintenance initiatives, correct deficiencies in the safety precautions and the equipment control programs, and continue procedure and program upgrades. The licensee should provide sufficient oversight to ensure effective implementation of the program upgrades.

D. Emergency Preparedness

1. Analysis

The assessment of this functional area included activities related to the establishment and implementation of emergency plan and implementing procedures, licensee performance during exercises and actual events that tested emergency plans, and interactions with onsite and offsite emergency response organizations during exercises and actual events.

During this assessment period, region-based inspectors conducted two emergency preparedness inspections. The first inspection consisted of observation and evaluation of the annual emergency response exercise. The second inspection involved a review of the operational status of the emergency preparedness program.

The staff found that the licensee's preparation for, and response to the October 1989 emergency response exercise was good and showed improvement over the previous annual exercise which had identified eleven deficiencies. During the 1989 exercise, ten of the previous deficiencies were closed out. The control room staff was observed to work well as a team, establishing a good flow of information and timely implementation of emergency operating procedures. Staffing and activities in the emergency response facilities were prompt and efficient and event detection, classification, and recommendation of protective actions were timely and accurate. The licensee also demonstrated a sound approach to identifying and characterizing exercise weaknesses through their critique process. The licensee's overall performance during the exercise was indicative of the licensee's competence to successfully implement the necessary measures in the event of an actual emergency.

During the exercise, evaluators identified four exercise weaknesses. One weakness involved two examples of failure to follow emergency notification procedures in the control room and in the technical support center (TSC). This weakness was a repeat finding similar to a deficiency identified during the previous exercise. Another weakness involved the failure of dose assessors in the TSC to use appropriate information on core degradation in performing dose assessments. Access and egress control in the TSC and Emergency Operations Facility (EOF) was determined to be a weakness and a weakness was

identified in the EOF for failure to maintain the radiological status boards current. This observation resulted in EOF managers not always being aware of current radiological conditions offsite.

A review of the operational program status found the licensee's emergency response facilities to be well maintained, secure, and adequately equipped. The licensee's TSC was noted to be particularly spacious and functional. The licensee's management control of emergency preparedness was found to be effective and the emergency planning staff was well qualified and experienced. Training requirements in emergency preparedness were found to have been met and the proficiency of emergency responders was determined to be good as evidenced by their performances during exercises, drills, and the NRC-conducted walkthrough interviews. The annual QA audit was found to be of appropriate scope and depth to meet the requirements in this area. Audits and surveillances were well planned and performed by qualified personnel. Documentation and followup of findings was in conformance with the licensee's QA plan for emergency preparedness.

An issue was identified during the assessment period related to changes made by the licensee in their emergency action levels (EALs) contained in the emergency plan. The changes were implemented in August 1989 without NRC approval, which was authorized by the regulations only if it was determined that the changes did not decrease the effectiveness of the emergency plan. Although the licensee had made this determination, a subsequent review of the changes by the NRC staff concluded that several of the proposed changes decreased the effectiveness of the plan. A meeting was held and the licensee made commitments that included revising, with NRC review, certain EALs. The licensee also committed to issuing immediate guidance to operators and emergency decision makers regarding the subject EALs.

In summary, during the assessment period the licensee showed improvements in areas such as performance during exercises, emergency facilities, and information flow among facilities during the emergency exercise. The licensee's overall performance during the assessment period indicated that the licensee was fully capable of satisfactorily implementing the emergency plan, if needed. The licensee's newly installed control room simulator will be a useful training aid in emergency preparedness.

2. Performance Rating

The licensee is considered to be in Performance Category 2 in this functional area. The licensee's performance was determined to be improving during this assessment period.

3. Recommendations

a. NRC Action

Inspection effort should be consistent with the fundamental inspection program.

b. Licensee Actions

Management should assess improvements to ensure that revisions to the emergency plan are in conformance to the regulatory provisions.

E. Security

1. Analysis

The assessment of this functional area included activities related to the security of the plant, including all aspects of access control, security checks, safeguards, and fitness-for-duty activities and controls.

During this assessment period, this functional area was inspected on an ongoing basis by the resident inspectors and on three occasions by region-based physical security inspectors.

Since the last assessment period, the licensee had completed a major security program upgrade. This effort included extensive perimeter security hardware improvements and new central and secondary alarm stations (CAS/SAS). Inspections found that the new systems had reduced the licensee's reliance on compensatory posts and had generally added substantial improvement to the security program.

A problem that the licensee encountered during the 1989 refueling outage dealt with temporary personnel who did not adhere to the plant security requirements. The licensee logged dozens of incidents when personnel failed to wear badge/keycards inside the protected area (PA), lost badges or keycards, carried badges or keycards out of the PA, left designated vehicles inside the PA with a key in the ignition, and left vital area doors unsecured. The licensee's management quickly became aware of these problems but was not effective in significantly reducing the occurrence of such incidents until the end of the refueling outage. The licensee's corrective actions were markedly effective, as evidenced by the reduced occurrence of such violations during the 1990 refueling outage.

During the assessment period, the licensee made several changes to their security plan. One change to the safeguards contingency plan, which was found to degrade its effectiveness, was made without NRC review and was inconsistent with the provisions of 10 CFR Part 50.54(p). Other submitted changes were found to be appropriate.

In regard to the licensee's fitness-for-duty program, the resident inspector attended a training session given by the licensee and noted that the training was satisfactory and in accordance with the requirements of 10 CFR Part 26.

The licensee's annual audit of the physical security program followed the licensee's established guidelines. The audit covered numerous surveillances and had several findings. The depth and scope of the audit were considered adequate. A concern was raised with the licensee's untimeliness in correcting one adverse QA finding related to a violation issued in December 1989, which involved the licensee's failure to adhere to a procedure that specified responsibilities related to Safeguards Information (SGI). Subsequently, in a letter to NRC, the licensee indicated that it will place QA findings on a tracking system that will allow weekly reviews to improve timeliness of corrective actions.

In summary, the security program at Cooper Nuclear Station appeared to be well managed. The program received the support of the licensee's corporate management. The program provided for annual requalification of security officers. The security force appeared to be adequately staffed and trained. Officers were motivated to perform well. The security program management appeared to be seeking improvement in all aspects of their licensed program.

2. Performance Rating

The licensee is considered to be in Performance Category 2 in this functional area. The licensee's performance was determined to be improving during this assessment period.

3. Recommendations

a. NRC Actions

Inspection effort in this functional area should be consistent with the fundamental program.

b. Licensee Actions

The licensee management should emphasize the prompt completion of corrective actions and should continue proactive efforts dealing with [illegible]e personnel who violate plant security requirement.

F. Engineering/Technical Support

1. Analysis

The purpose of this functional area was to address the adequacy of technical and engineering support for all plant activities. It included all licensee activities associated with the design

of plant modifications; engineering and technical support for operations, outages, maintenance, testing, surveillance, and procurement activities; training; fire protection/prevention; and configuration management.

This functional area was inspected on an ongoing basis by the resident inspectors and periodically by region-based personnel.

The licensee continued to refine their system engineer concept, and resources were assigned to systems important to safety. There were 27 system engineers. A formal system engineer training program was developed and training was in progress. In addition, an engineering support group was created in this assessment period to reduce collateral duties and allow system engineers to focus more attention on their primary function.

Communications between the site and the general office engineering group continued to improve. Nuclear engineering department personnel were assigned to act as liaison between the site and the general office during the last outage. These engineers appeared to develop the same sense of "ownership" that is normally demonstrated by site personnel.

Inspection of the fire protection and postfire safe shutdown capabilities determined that the licensee was properly implementing the necessary fire protection programs and that management involvement was evident. The licensee's configuration management program was considered to be a strength of the Cooper Nuclear Station (CNS) fire protection efforts.

Management attention to training was identified as a weakness in the previous SALP. Training continued to be a concern throughout the assessment period. This was evidenced by a repeat violation for inadequate training records, low morale in the training department, and the failure of two of four individuals to pass the senior reactor operator (SRO) license examinations. In addition, the requalification program was given a satisfactory rating by only a narrow margin, and a training audit identified problems in licensed operator training. These problems included resource limitations which might have precluded making simultaneous improvements in examination material and implementing a site specific simulator program. A training task force had been instituted to implement a formal training program for all licensee personnel. However, because of past problems in the training area and the perceived poor morale of training department instructors, a need for continued management attention was evident. The licensee did take actions to improve training; however, the effectiveness of these measures had not been evaluated by the end of the assessment period.

Some material improvements had been observed in training. The plant specific simulator was declared operational during the assessment period and was being utilized in operator training. The computerized training records system was completed in the assessment period.

The welding program, identified as a weakness early in the assessment period, improved and exhibited many strengths. Plant procedures and contractor programs provided comprehensive instructions for the performance of activities. The licensee significantly enhanced the welding program controls and effectively implemented program requirements. Additionally, the licensee hired a welding program supervisor to provide oversight of the welding program.

The licensee had properly implemented a program to assure compliance with the requirements of Regulatory Guide 1.97.

Evaluations of design changes, modifications, and root cause determinations found that the licensee's engineering efforts were conservative and thorough. A major team inspection of the licensee's maintenance activities did, however, disclose some weaknesses in design and configuration control, the control of vendor technical information, and the control of on-the-spot changes.

There were two refueling outages conducted during this period. Management of the second outage represented a significant improvement over the first. The improvement was attributed to the effectiveness of the new outage organization, which had a senior manager onsite 24 hours a day. The approval of design packages prior to the commencement of the outage, which was identified as a weakness in the previous SALP, remained a problem.

An improvement in the licensee's ability to make operability determinations was noted. Both site and nuclear engineering personnel evidenced an increased sensitivity to operability as demonstrated by the response to an audit-identified problem with battery racks.

In addition, the licensee exhibited its engineering and technical support ability in the preparation of the Cycle 14 reload amendment package. This amendment involved several complex issues, including the first use of GE8X8NB fuel assemblies, the reduction of the minimum critical power ratio safety limit from 1.07 to 1.06, and the generic specification of fuel assembly design. The licensee prepared the amendment request using methodology acceptable to the staff in a timely manner. Because of the high quality engineering and technical support that was

evident in this submittal, the staff was able to complete its review promptly, without need for requesting additional information, and issued the amendment on schedule.

The licensee's control over, and training of, contractor personnel was observed to have improved during this SALP assessment period as evidenced by preparations for, and work during, the refueling outage.

In summary, increased management involvement in this area was evident. Improvements were noted in the engineering area during the assessment period, including effectiveness of system engineers and support for general plant operation. Significant weaknesses were noted in training support and effectiveness and, while attempts had been made to improve training programs, continued evaluation and effort will be required.

2. Performance Rating

The licensee is considered to be in Performance Category 2 in this functional area.

3. Recommendations

a. NRC Actions

Inspection effort in this functional area should be consistent with the fundamental inspection program. Regional initiative inspections should include an evaluation of the training program.

b. Licensee Action

The licensee should provide management attention to the training area.

G. Safety Assessment/Quality Verification

1. Analysis

The assessment of this functional area included all licensee review activities associated with the implementation of licensee safety policies; licensee activities related to amendment, exemption, and relief requests; response to NRC generic letters, bulletins, and information notices; and resolution of TMI items and other regulatory initiatives. It also included activities related to the resolution of safety issues, 10 CFR 50.59 reviews, 10 CFR 21 assessments, safety committee and self-assessment activities, root cause analyses of plant events, use of feedback from plant QA/QC reviews, and participation in self-improvement programs. It included the effectiveness of the licensee's

quality verification function in identifying and correcting substandard or anomalous performance, in identifying precursors of potential problems, and in monitoring the overall performance of the plant.

This area had been inspected on an ongoing basis by the resident inspectors and by region-based personnel. Specific areas inspected included audits, corrective action, self-assessment capability, materials handling, document control, and QA program review.

Inspections conducted during this assessment period indicate that the licensee had implemented an acceptable quality verification process, which included a corrective action program and an audit program that appeared to be effective. These programs provided for identifying problems, determining root causes, establishing corrective actions, tracking, verifying completed corrective actions, and trending. There appeared to be certain weaknesses, in some areas, already identified by the licensee. Program enhancements had been initiated by the licensee to correct these weaknesses.

Root cause determination, which was identified as a weakness in the previous SALP, became a strength. All station engineers and corporate engineers received root cause analysis training. QA staff members also attended the root cause analysis training. In addition, a nonconformance overview committee was formed to provide an additional check on the quality of the root cause analysis. Results indicated that root cause analyses were effective and generally resulted in timely resolution of issues. The number of open nonconformance reports had been reduced.

Management involvement in the licensee's safety review and audit board (SRAB) was identified as a weakness in the previous SALP. The SRAB was reconstituted under a new charter during this assessment period. Significant changes to the SRAB included more senior management participation, the addition of outside voting members with industry experience, and the formation of subcommittees. The documentation of SRAB meetings was found to be more detailed than in the previous assessment period, and resolution of concerns appeared to be more effective.

The station operations review committee (SORC) activities had shown improvement, specifically with respect to the effectiveness of root cause analysis and corrective actions.

Improvements were noted in terms of documentation of technical staff activities and followup of recommendations. The technical staff was expanded during this assessment period to function as an Independent Safety Review Group. This group provided input for procedure overview and provided an independent review of safety analyses for proposed activities.

During this review period, the licensee's control of drawings and procedures was found to meet commitments and regulatory requirements. Administrative controls and implementing procedures provided an acceptable mechanism for issuing and distributing documents important to safety.

The licensee's program for receipt, storage, and handling of equipment and materials appeared to be prescribed adequately and in conformance with regulatory requirements. Implementation activities were found to be consistent with the procedural instructions contained in the program.

The licensee's control of contractors appeared to improve during this assessment period as evidenced by the reduction in problems noted during the last refueling outage.

The effectiveness of the QA/QC function was identified as a weakness in the previous SALP. The licensee added four QA engineers to the corporate QA department and two QA engineers to the site QA department. In addition, functions such as QA review of design changes, which were the responsibility of the site QA staff, were transferred to the corporate QA staff.

While audits were generally good, in some cases they were not thorough. In some instances, it appeared that CNS auditors did not have the technical expertise required. It was also noted that some surveillances were more compliance oriented than performance oriented. This had previously been identified by the licensee. The licensee reached agreement with other licensees to provide technical expertise for specified internal audits. This was an excellent approach to enhancing the internal audit program. CNS was planning to upgrade the surveillance program and audit program process to have a more performance based methodology. Even with the increase in staff size, the QA staff level was minimal for support of training initiatives to accomplish performance based audits and surveillances.

During this assessment period, the QA department performed an internal evaluation to determine the effectiveness of the peer QC program. The results of the evaluation identified areas for improvement, including the necessity to more clearly define QC requirements and QC independence.

The licensee improved in their self-assessment capabilities. This was demonstrated early in the assessment period when the licensee discovered an undocumented type of wiring on a component previously believed to be qualified. In response to this finding, the licensee promptly assessed the safety significance of the wiring discrepancy and the safety implication of previous operation at power. The licensee's comprehensive evaluation of this complex issue was carried out promptly and efficiently

during the refueling outage, while numerous other technical issues were under review. It was an example of the licensee's capability to handle a significant technical review in a safe and expeditious manner.

The licensee's responses to Generic Letters 89-13, 89-08, 89-07, and 89-06, provided to the staff during the assessment period, were examples of the quality of licensee submittals. These submittals were timely, technically correct, and complete, permitting the staff to complete its review during the assessment period without the need to seek additional submittals to correct omissions or errors. The licensee had been highly proactive in anticipating licensing activities well in advance of their needs and had worked closely with the staff to assure that submittals were complete and timely. This effort assured that licensing actions did not need to be handled as emergency or exigent actions and no waivers of compliance were required to permit continued operation due to events or actions that could have been anticipated.

In summary, the licensee made significant improvements in this functional area during this assessment period. The licensee was timely and responsive to NRC technical concerns. They proposed technically sound resolutions and demonstrated a clear understanding of the technical issues. Root cause determination and corrective actions went from a weakness to a strength. Reconstitution of the SRAB and the technical staff should improve self-assessment capabilities. QA staff size increased during this assessment period and contributed to increased effectiveness as did the use of technical expertise from other licensees. The licensee's control of contractors appeared to improve.

2. Performance Rating

The licensee is considered to be in Performance Category 2 in this functional area.

3. Recommendations

a. NRC Actions

Inspection effort in this functional area should be consistent with the fundamental inspection program.

b. Licensee Action

Licensee management should continue improvements noted in this functional area. Management should determine if a performance based QA plan can be adequately implemented with the present resources.

V. SUPPORTING DATA AND SUMMARIES

A. Licensee Activities

1. Major Outages

- The plant was in the End-of-Cycle (EOC) 12 refueling outage from April 7, 1989, through June 17, 1989.
- The plant was in the EOC 13 refueling outage from March 4, 1990, through May 6, 1990.

2. License Amendments

During this assessment period, five license amendments were issued. Two of the more significant amendments were as follows:

- Changed the TS to add limiting conditions for operation and surveillance requirements relating to containment integrity during venting and purging operations - Amendment 129
- Furnished information to support: (1) use of enhanced analytical methodologies for the new fuel design (2) lowering the minimum critical power ratio (MCPR) safety limit, and (3) editorial and definition changes to reflect the use of the new fuel assemblies and the associated analytical methodology used for the Cycle 14 reload - Amendment 133

3. Significant Modifications

- Installed the Standby Nitrogen Injection System to replace the air containment atmospheric dilution (ACAD) system.
- Modified the emergency diesel generator (EDG) tubing (material and orientation) and relocated instrumentation onto seismically qualified racks to improve EDG reliability.
- Control room design was upgraded to address TMI human fact 's concerns.
- Modified the feedwater control system to improve system responsiveness.

B. Direct Inspection and Review Activities

NRC inspection activity during this SALP cycle included 51 inspections performed with approximately 5761 direct inspection hours expended.

C. Enforcement Activity

The SALP Board reviewed the enforcement history for the period April 16, 1989, through July 15, 1990. The enforcement history is tabulated in the enclosed table. No orders or confirmatory action letters were issued.

TABLE

ENFORCEMENT ACTIVITY

	FUNCTIONAL AREAS	NUMBER OF VIOLATIONS IN SEVERITY LEVEL					
		Weaknesses	Dev*	NCVs**	V	IV	III
A.	Plant Operations					1	
B.	Radiological Controls				1	1	
C.	Maintenance/Surveillance			2		3	
D.	Emergency Preparedness	4					
E.	Security					4	
F.	Engineering/Technical Support		1	4		5	
G.	Safety Assessment/ Quality Verification		1	2		2	
	TOTALS	4	2	8	1	16	0

* Deviations
** Noncited violations