INITIAL SALP REPORT
U.S. NUCLEAR REGULATORY COMMISSION

REGION IV

SYSTEMATIC ASSESSMENT OF LICENSEE PERFORMANCE

NRC INSPECTION REPORT NO. 50-298/92-99

Nebraska Public Power District

Cooper Nuclear Station

July 16, 1990, through January 18, 1992

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I. INTRODUCTION

The Systematic Assessment of Licensee Performance (SALP) program is an integrated NRC staff effort to collect available observations and data on a periodic basis and to evaluate licensee performance on the basis of this information. The program is supplemental to 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 February 20, 1992, to review the observations and data on performance and to assess licensee performance in accordance with Chapter NRC 0516, "Systematic Assessment of Licensee Performance," dated September 28, 1990.

This report is the NRC's assessment of the licensee's safety performance at the Cooper Nuclear Station for the period July 16, 1990, through January 18, 1992.

The SALP Board was composed of:

Chairman

A. B. Beach, Director, Division of Reactor Projects (DRP), Region IV

Members

D. D. Chamberlain, Deputy Director, Division of Reactor Safety (DRS), Region IV
J. P. Jaudon, Deputy Director, Division of Radiation Safety and Safeguards (DRSS), Region IV
J. T. Larkins, Director, Project Directorate IV-1, Division of Reactor Projects-III, IV, V, Office of Nuclear Reactor Regulation (NRR)
P. H. Harrell, Chief, Project Section C, DRP, Region IV
R. B. Bevan, Project Manager, Cooper Nuclear Station, NRR
G. A. Pick, Senior Resident Inspector, Wolf Creek, DRP, Region IV

The following personnel also participated in the SALP Board meeting:

J. M. Montgomery, Deputy Regional Administrator, Region IV
I. Barnes, Chief, Material Quality Programs Section, DRS, Region IV
P. C. Wagner, Acting Chief, Operational Programs Section, DRS, Region IV
B. Murray, Chief, Facility Inspection Programs Section (FIPS), DRSS, Region IV
E. E. Collins, Project Engineer, Project Section C, DRP, Region IV
R. A. Kopriva, Senior Resident Inspector, Braidwood, DRP, Region III
S. L. McCrory, License Examiner, Operator Licensing Section, DRS, Region IV
D. B. Spitzberg, Emergency Preparedness Specialist, FIPS, DRSS, Region IV

II. SUMMARY OF RESULTS

Overview

Overall, licensee performance was noted to be good. In the functional area of Plant Operations, operation of the facility was generally conservative during

the performance of routine, day-to-day activities. However, when placed in a nonroutine emergency environment, weaknesses were identified with the performance of the licensed operators. In addition, management had not established expectations to provide guidance for the performance of the operations staff in some areas.

In the functional area of Radiological Controls, concerns were identified with the implementation of radiological control programs during the high activity period of an outage. During routine operations, the performance was very good.

In the functional areas of Maintenance/Surveillance and Security, management oversight and involvement was apparent. The performance level by the individuals implementing programs in these functional areas was excellent.

In the functional area of Emergency Preparedness, concerns were identified with the performance of licensed operators, during simulated emergency events, with the implementation of the emergency plan. The performance of the licensee during emergency exercises was generally good; however, a number of weaknesses were identified during emergency exercises, including the self-critique process.

In the functional area of Engineering/Technical Support, the licensee demonstrated good performance in the implementation of engineering-related programs. However, actions to address the ongoing concerns related to the licensed operator training program have not been effective.

In the functional area of Safety Assessment/Quality Verification, the audit and self-assessment programs were effective. Concerns were identified with the high threshold for documenting potential safety deficiencies in the corrective action program.

The licensee's performance category rating for each functional area assessed is provided in the following table, along with the performance category rating provided from the previous SALP assessment period.

Functional Area	Rating Last Period 04/16/89 - 07/15/90	Rating This Period 07/16/90 - 01/18/92
Plant Operations	1	2
Radiological Controls	1	2
Maintenance/Surveillance	2+	1
Emergency Preparedness	2+	2
Security	2+	1
Engineering/Technical Support	2	2
Safety Assessment/ Quality Verification	2	2

\+ Improving Trend - Licensee performance was determined to be improving during this assessment period.

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 area should include the core program, with regional initiatives in operations staff performance during simulated emergency conditions, the use and control of procedures, and review of licensee management expectations for various activities related to operation of the facility, including the use and control of procedures.

b. Licensee Actions

Licensee management should take actions to provide the appropriate level of training to the operations staff to upgrade the staff performance in simulated emergencies and initiate actions to ensure that performance expectations are provided to the operations staff for various activities related to the operation of the facility, including the use and control of procedures.

B. Radiological Controls

1. Analysis

The assessment of this functional area consists of activities related to radiation protection, radioactive waste management, radiological effluent control and monitoring, water chemistry controls, solid radioactive waste processing, and transportation of radioactive materials. This area was routinely inspected by the resident inspectors and on two occasions by region-based radiation specialists. The enforcement history in this functional area identified several violations involving potentially significant weaknesses in the radiological protection program.

During the previous assessment period, concerns were identified involving the radiological protection training program, the designation of a full-time radiological protection training coordinator, and the expertise of the quality assurance audit team responsible for reviewing the radiological protection program. During this assessment period, the licensee made excellent progress in addressing the quality assurance audit team weakness by using individuals from other nuclear power facilities with experience in radiological protection activities as technical experts on the quality assurance audit team. Improvements were also made concerning radiological protection training activities.

Appendix A

The evaluation criteria, category definitions, and SALP process methodology that were used, as applicable, to assess each functional area are described in detail in NRC Manual Chapter 0516, dated September 28, 1990. This chapter is available in the Public Document Room files. Therefore, these criteria are not repeated here, but will be presented in detail at the public meeting to be held with licensee management at 10 a.m. on March 24, 1992.

IV. PERFORMANCE ANALYSIS

A. Plant Operations

1. Analysis

This functional area consists primarily of the control and execution of activities directly related to operating the plant. Inspection effort in this area consisted of routine observations by the resident inspectors and periodic inspections by region-based inspectors. The enforcement history in this functional area indicated that the identified violations were minor, not repetitive, and not indicative of a programmatic breakdown. When violations were identified, the licensee was usually proactive in addressing the issues.

In the previous SALP report (NRC Inspection Report 50-298/90-21), concerns were identified in the area of training support for the operations staff. These concerns are discussed in the functional area of Engineering/Technical Support.

Management attention and oversight of the safe operation of the facility was usually evident. Examples included shutting down the plant on two different occassions to identify the source of unidentified reactor coolant system leakage prior to the leak rate exceeding the value specified in the Technical Specifications and to repair a leak on a feedwater check valve hinge pin, management proactively establishing a plan for plant operation in anticipation of the annual drop in river level, and senior site management touring the control room on a d 'ly basis to maintain an awareness of the status of the plant.

The intraorganizational communications between the operating staffs and other onsite organizations were notable, as evidenced by communications between operations and crafts personnel during the performance of maintenance and surveillance activities. Through management efforts, there were no illuminated annunciators on the main control boards during steady-state operations. Operations personnel maintained a high level of awareness of the status of plant equipment. Overall, the performance of the operating crews was excellent during routine, day-to-day activities.

Although conservative actions were usually demonstrated toward plant operations, appropriate management conservatism was not always evident. For example, a temporary elevator was installed, to allow access to the containment roof for repairs, in the area of the plant main electrical switchyard. As a result of high winds, a cable on the elevator came loose and shorted the 345-kV offsite power supply for the plant, resulting in a reactor trip from 100 percent power and a challenge to safety systems.

...ppression pool parameters, failing to recognize the unavailability of the ...high pressure coolant injection pump, and failing to observe and investigate a ...diesel generator trip during a surveillance test.

Based on the results of examinations, exercises, and observations, as discussed above, it is apparent that the operating crews are very capable of performing routine, day-to-day activities; however, in simulated, nonroutine emergency situations, the performance of the operating crews was weak. It was also noted that the operating crews experienced difficulty in making decisions and overseeing the response to an event, which is an indication that the crews have not received the appropriate level of training in this area. It may also indicate that management has not provided operations personnel with its expectations for a standard for on-shift communications and a clearly defined position with respect to the decisionmaking authority of the operating crews.

The quality of the procedures used by the operations department was good and provided sufficient guidance for the performance of plant evolutions, as evidenced by no major plant problems being initiated as a result of procedural inadequacies. The licensee had upgraded the quality of procedures through its procedure upgrade program; however, concerns were identified with the method used by the licensee for validation and verification of emergency operating procedures. The validation and verification program did not require a plant walkdown for complex emergency procedures to ensure that the procedures could be performed as written. Also safety evaluations for procedures were being performed by the operations department in lieu of a multidisciplined review team. In addition, it was noted that independent valve verification was not adequately addressed by controlling procedures.

The operators demonstrated some weaknesses in the use of procedures when, on four occasions, the operators failed to issue a temporary procedure change when a procedure error was identified and relied on memory to perform an evolution in lieu of having the procedure available at the work location. These examples of failing to properly control and use procedures were not safety significant; however, they are an indication of a lack-of-attention to detail by operations personnel.

Housekeeping in the plant was excellent. On one occasion, an operator ...correctly lined up the alternate cooling water for an air compressor because the ...es were not accurately labeled. The operator was performing this evolution poor lighting in the area where the valves were located and because the ...sponse to a reactor trip concurrent with a loss of offsite power. ...ng of plant components was found to be of a quality to support component ...ations by plant personnel.

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Housekeeping in the plant was excellent. On one occasion, an operator incorrectly lined up the alternate cooling water for an air compressor because of poor lighting in the area where the valves were located and because the valves were not accurately labeled. The operator was performing this evolution in response to a reactor trip concurrent with a loss of offsite power. Labeling of plant components was found to be of a quality to support component manipulations by plant personnel.

Overall, it appeared that management attention and oversight was conservative; however, apparent nonconservative actions were sometimes taken. Performance of the operating staff was excellent during routine, day-to-day activities. When presented with a simulated, nonroutine emergency event, significant weaknesses were identified in command, control, communications; the ability to diagnose equipment conditions; and accident mitigation. Procedures were generally good, but were not always properly used, and housekeeping was excellent.

An example was identified where management failed to take the appropriate actions when the diesel generators were declared inoperable. Licensee management failed to follow procedures by not declaring a Notice of Unusual Event, as required by the emergency plan, when both emergency diesel generators were declared inoperable. Although the licensee considered the diesel generators to be degraded rather than inoperable, because the room coolers were found not to be seismically installed, the appropriate emergency plan actions were not taken.

The plant operations staff also performed its duties in a conservative manner during routine plant startups and shutdowns and demonstrated a professional approach toward plant operations. During this assessment period, a number of minor plant perturbations (e.g., reactor trip, residual heat removal valve failure, and feedwater/vessel level transient) were experienced. Because of the actions taken by the operating crews, the perturbations did not result in more serious conditions. However, no major plant challenges were experienced by the operations staff during this assessment period.

The licensee continued to maintain a very experienced and knowledgeable group of licensed senior reactor and reactor operators. In the previous assessment period, the licensee had 37 licensed senior reactor and 14 licensed reactor operators. There were 32 senior reactor operators and 7 reactor operators licensed at the facility at the end of this assessment period. During this assessment period, 12 applicants were examined for initial licenses and 12 licensed operators were given requalification examinations on four separate examination visits. With this staffing level, the licensee was able to maintain a six-shift rotation for the operating crews.

The plant reference simulator became operational during this assessment period. It was noted that the training staff was effective in using the simulator for training and evaluation, with one significant exception. In activities where operators, including licensed operators applying for a senior operator license, were observed in a dynamic simulator environment, command, control, and communications were identified as weak or deficient. Examples identified during examinations included senior reactor operator applicants going behind panels during emergency events to read indications, failing to recognize that all panel operators were at the back panels simultaneously, and failing to recognize the scope of problems as a result of undisciplined communications. Examples observed during emergency exercises included the control room supervisor neglecting supervisory responsibilities by walking down back panels during the simulated casualty, failing to provide clear supervision to the panel operators, and disseminating incorrect information affecting emergency response as a result of weak on-shift communications. Command, control, and communications were a major contributor to the crew failure during the requalification examinations.

It was also observed, during simulated emergencies, that the ability of operators and crews to monitor and diagnose equipment and plant conditions and take appropriate action was sometimes weak, indicating a generic lack of diagnostic skill among operators. Examples included not adequately monitoring

It was noted that the radiological protection department performed well during routine plant operations when a small number of jobs were ongoing. The radiological protection department maintained a stable staff with a low turnover rate. A good working relationship existed between the radiological protection department and other departments. Boundaries and access for the radiologically controlled area access had been improved by the establishment of a single access control point. State-of-the-art personnel contamination monitors, tool monitors, and an electronic, computer-based dosimetry system had been added as part of a radiation protection upgrade program. Person-rem exposures continued to be below the national average for a boiling water reactor.

Except for the concerns with ALARA staffing identified during the outage, the licensee established good procedures and a management policy statement for the ALARA program. Management demonstrated a strong commitment to keeping radiation exposures ALARA, such as reducing reactor power prior to conducting work in areas where radiation levels were a function of reactor power level. The ALARA coordinator established good ALARA packages as part of the planning and preparation effort for the refueling outage.

However, during the refueling outage, violations were identified that involved the failure to locate monitoring dosimetry properly on radiation workers and to specify multiple dosimetry on special work permits. The violations related to the failure to specify multiple dosimetry on special work permits is of concern, since it involves a basic licensee responsibility to ensure that adequate dosimetry be provided to radiation workers for accurate monitoring of radiation doses received by individuals. Although this concern was identified during the refueling outage, the concern also exists for routine, day-to-day activities that may involve work in high radiation areas. In addition to the identification of these violations, concerns were also identified with the licensee's programs and/or implementation activities when the licensee's radiological protection staff was stressed during the outage. Examples include inadequate posting of hot spots, real-time tracking of radiation exposures, and coordination of work activities between responsible drywell contract radiological protection technicians and licensee radiological protection personnel. The size of the as-low-as-reasonably-achieveable (ALARA) staff was marginal for refueling activities, resulting in ALARA personnel not spending adequate time in the radiological controlled area to evaluate proposed work or to observe work in progress and limited involvement in mockup training for maintenance jobs involving significant radiological control problems. Communications, coordination, and controls among plant radiation protection personnel, contractor radiological protection technicians, and radiation workers were identified as the apparent reason for the poor performance by the licensee's radiological protection staff during the refueling outage.

The weaknesses and concerns discussed above are an indication of ineffective management oversight during the high activity period of an outage. It appears that the licensee's radiological protection personnel resources were marginally adequate, even when supplemented by an appropriate number of well-qualified contract radiological protection technicians, to provide the proper level of control of contract radiological protection technicians and radiation workers. The concern of limited personnel resources was further compounded by weak programs for controlling radiological protection activities.

The licensee maintained excellent gaseous and liquid effluent control and sampling and analysis programs, which demonstrated compliance with Radiological Effluent Technical Specifications and the Offsite Dose Assessment Manual. An effective liquid and gaseous release permit program was established to ensure that planned effluent releases to the environment received proper review and approval prior to the release. The quantities of radionuclides released and the calculated offsite doses were within specified limits. There were no unplanned radiological releases during this assessment period and no design changes were made to the radwaste management systems. Initial comparisons between NRC and licensee offsite radiation dose calculation results from radioactive effluents were performed and the results indicated excellent agreement. Semiannual effluent release reports were prepared and submitted in the proper format and contained the required information. A good program was maintained for testing and surveillance of safety-related air cleaning systems. A well-qualified staff had been established to implement the radiological effluent release program.

Excellent radiochemistry and water chemistry programs were maintained, which agreed with industry guidelines and complied with regulatory requirements. The results of the water chemistry confirmatory measurements were in 100 percent agreement, which indicated a significant improvement over the 81 percent agreement achieved during the previous assessment period. Radiological confirmatory measurements results were in 100 percent agreement for the radiochemistry and the health physics counting rooms, which showed an upward trend from the 97 percent agreement achieved during the previous assessment period. The licensee maintained state-of-the-art instrumentation, and water chemistry and radiochemistry procedures were excellent and reflected current analytical techniques. EPRI chemistry control guidelines, along with General Electric chemistry specifications, were specified in station chemistry procedures and strictly maintained. The licensee implemented an excellent chemistry data management program to record and trend chemistry water quality data. The staffing level in the chemistry section remained the same as during the previous assessment period, with a low turnover rate.

The training department established excellent general employee and advanced radiation worker training programs. Training initiatives resulted in a lower number of personnel contamination events. However, a weakness in the area of training was identified. A second instance was noted in which the licensee had failed to conduct the semiannual training of technicians on the proper operation of sampling systems, as required by facility procedures. The failure to conduct training was identified as a violation in the previous assessment period and the failure to implement adequate corrective action for the original violation was the apparent cause of the second violation.

The solid radwaste and transportation programs were noted to be excellent. Procedures for characterization, classification, and shipment of radioactive materials were good. The program was sufficiently staffed and effectively supervised. There were no changes in the solid radwaste process control program.

Quality assurance audits and surveillances performed of the activities discussed in this functional area were comprehensive. The personnel performing the audits were knowledgeable and the audit teams included personnel with technical expertise. The licensee's responses to the audit findings were timely and technically correct.

In summary, the radiological protection department performed very well during routine plant operations and made several program improvements and refinements. However, several problems were identified during the refueling outage as a result of poor communications, coordination, and controls. The size of the ALARA staff was marginal to handle the work generated during refueling outage activities. The types of problems identified during the outage indicated poor communications, coordination, and controls among plant radiological protection personnel, contract radiological protection technicians, and radiation workers during the high activity period. Person-rem totals were below the national average. Radioactive liquid and gaseous waste effluents monitoring and control programs were effective. Confirmatory measurements indicated an improvement in water chemistry and radiochemistry measurements. Excellent solid radwaste control and radioactive materials transportation programs were maintained.

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 include the core program, with regional initiatives to review selected licensee radiological protection programs and their implementation.

b. Licensee Actions

Licensee management should take actions to resolve the concerns identified with the implementation of radiological protection programs during outage activities and to verify that program implementation during routine, day-to-day activities is being effectively implemented.

C. Maintenance/Surveillance

1. Analysis

The assessment of this functional area includes all activities associated with predictive, preventive, and corrective maintenance; installation of plant modifications; and maintenance of the plant physical condition. This functional area also includes conduct of all surveillance, inservice inspection, and inservice testing activities.

During this assessment period, inspections were conducted on a routine basis by the resident inspectors and on several occasions by region-based inspectors. The region-based inspections included performance-based inspections of maintenance activities, a system entry retest inspection, a verification of containment isolation component exemption inspection, and two inspections of inservice inspection activities. The enforcement history in this functional area was superior.

The previous SALP report recommended implementation of predictive maintenance initiatives, correction of deficiencies in the safety precautions and the equipment control programs, and continuance of procedure and program upgrades. During this assessment period, maintenance procedures and processes were strong and had significantly improved. The licensee had completed development of a predictive maintenance program, and no major problems occurred as a result of equipment control.

The licensee's performance of maintenance activities was superior. Management oversight and involvement was demonstrated by issuance of guidelines to instrumentation and control personnel for self-verification and checking. Departmental discussions and cautions during outage meetings focused attention to tasks and safety work activities. The maintenance procedures and processes were strong and significantly improved from those identified in the previous assessment period. The licensee, however, had not established adequate controls to address cleanliness and housekeeping requirements for safety-related maintenance activities. This issue was previously identified as a weakness in the maintenance team inspection performed in 1989 and apparently has not been addressed.

Improvements in maintenance programs continued during this assessment period. Postmaintenance testing improved from that observed in the previous assessment period. The responsibilities for maintenance personnel at all levels were defined and maintenance personnel were experienced and well trained.

The verification of containment isolation component exemption inspection involved a walkdown of accessible penetrations and isolating components, review of local leak rate testing results, comparison of the plant system diagrams with the as-built plant, and review of the documentation relating to the three exemptions to the testing requirements of Appendix J to 10 CFR Part 50. The license had a strong program in the area of containment building leak rate testing. Personnel performing leak rate testing were knowledgeable and well trained. The three testing exemptions to the requirements of Appendix J had been properly documented and had been approved by the NRC. No major problems were identified, although a minor weakness in the labeling of containment building penetrations was identified.

Maintenance procedures were well written and provided excellent guidance to the craft personnel. However, several minor instances throughout this assessment period occurred because of inattention to detail that manifested itself in a failure to follow procedures or seek clarification. The calibration and maintenance measuring and test equipment programs were properly implemented; however, the controls for leak rate testing and inservice testing measuring and test equipment were weak. The nondestructive examination program and procedures adequately implemented the specified inservice inspection program methods.

Troubleshooting activities continued to be performed using skill-of-the-craft as guidance and vendor manuals as a reference. An increased use of special instructions, attached to maintenance procedures, for unusual maintenance activities was noted. The licensee developed guidelines that are referenced by the mechanics prior to performing maintenance. The guidelines provided instructions for common tasks such as bolt selection, torquing, and use of flexitallic gaskets.

Throughout this assessment period, improvements continued in the documentation of work performed. The peer quality control program was effectively implemented. The material condition of the plant continued to be very good. During the refueling outage, housekeeping was maintained at a satisfactory level. Internal communications were superior with the appropriate levels of management involved in maintenance activities.

The licensee's surveillance program continued 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, as evidenced by a lack of missed or overdue surveillance tests. Two exceptions were discovered at the beginning of this assessment period. The licensee determined the root causes to be personnel error and a deficiency in the computer program for scheduling. This was very similar to two missed surveillances during the previous assessment period and were found while reviewing the previous occurrences. Procedures for conducting surveillances were well written and easy to follow.

Personnel conducting surveillances were well qualified. Senior technicians and senior operations personnel provided excellent oversight and guidance to trainees while conducting on-the-job training. During surveillance performance, the licensee's staff continued to demonstrate superior communication and coordination. Throughout this assessment period, examples were identified where the licensee's proactive operating philosophy caused prompt identification of root causes for test failures. Several minor events occurred, while performing surveillance testing, that were reportable. The root causes were determined to be failure to follow procedure resulting from inattention to detail.

Key staff positions were identified and well defined. The licensee increased the size of the mechanical, electrical, and instrument and control staffs during this 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.

In summary, improvements in the maintenance and surveillance programs continued during this assessment period. The maintenance procedures and processes were strong and had significantly improved. The licensee completed development of their predictive maintenance program. Controls addressing cleanliness and housekeeping requirements for safety-related maintenance activities were a weakness. The licensee's surveillance program continued to be a strength. The material condition of the plant continued to be very good. Internal communications were superior with the appropriate levels of management involved in maintenance activities. The peer quality control program was effectively implemented. The enforcement history in this functional area was superior.

2. Performance Rating

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

3. Recommendations

None.

D. Emergency Preparedness

1. Analysis

This functional area includes activities related to the establishment and implementation of the emergency plan and implementing procedures, onsite and offsite plan development and coordination, support and training of emergency response organizations, licensee performance during exercises and actual events that test emergency plans, and interactions with onsite and offsite emergency response organizations during planned exercises and actual events. During this assessment period, no emergency events were declared.

Evaluation of this functional area was based on inspections performed by region-based emergency preparedness specialists and observations made by the resident inspectors. The inspections included evaluation of two annual emergency exercises and one operational status inspection. In this functional area, weaknesses were identified that indicated minor programmatic concerns.

The previous assessment recommended that the licensee ensure that revisions to the emergency plan conform with regulatory requirements. Improvements were noted during this assessment period regarding plan changes.

During the two exercises conducted, the emergency response organization effectively implemented the emergency plan and demonstrated that it could protect the health and safety of the public. During this assessment period, the licensee began utilizing its control room simulator in the dynamic mode to run the exercise scenario. This provided increased realism and challenge to the operators participating in the exercise. During both exercises, the licensee demonstrated prompt activation of emergency facilities, timely and accurate emergency classifications and notifications, and a good working relationship with offsite authorities.

The licensee's overall performance during the July 1990 exercise was very good. Several improvements were noted from previous exercises, most notably the information flow between emergency response facilities. Although, the overall performance was good , two exercises weaknesses were noted. One weakness involved the failure to maintain continuous accountability of essential personnel in the control room. The second weakness involved failure of the control room operators to anticipate the return to service of emergency equipment undergoing repair. The resultant delay in putting the equipment into use, once it was repaired, was critical because of its importance in mitigating the emergency. Corrective action to both exercise weaknesses was demonstrated to be effective during the following exercise.

During the July 1991 exercise, six exercise weaknesses were identified. Command and control was identified as a weakness in the control room and, late in the exercise, in the technical support center after the emergency director had left the facility to go to the emergency operations facility. A weakness, with several examples, was identified in the technical support center with technical assessment of accident conditions. In the operational support center, a weakness was identified with poor coordination, control, and radiological practices of in-plant repair and survey teams. A weakness in the emergency operations facility was identified in the assessment of offsite radiological consequences of the release due to a failure to recognize that the release was unfiltered. Several problems were noted with the preparation for the exercise. Finally, the licensee's self-critique process was weak in that it failed to identify several areas in need of corrective action.

While several weaknesses were identified in the 1991 exercise, the licensee was credited with having developed a particularly challenging exercise scenario. Had a less challenging scenario been used, some of the weaknesses may not have been identified. As an example, the weakness in the operational support center surfaced, in part, because the scenario caused decision makers to deploy 37 in-plant repair and survey teams into the plant over the course of the exercise. This number taxed the staff beyond what is normally observed during exercises. Overall, the weaknesses were consistent in nature and severity with those identified during challenging training exercises. Following the exercises, the licensee promptly initiated a corrective action plan and initiated an in-depth analysis of command and control in emergency response facilities.

Walkthroughs with control room operators identified weaknesses in the areas of emergency classification, notification messages, dose assessment, and formulation of protective action recommendations. Together, the weaknesses indicated a need for prompt corrective action to remediate the level of proficiency and training of control room operators to respond to rapidly escalating emergency conditions. Following the inspection, the licensee made strong commitments to immediately initiate remediation training and reevaluations of all operating crews in the areas found to be weak.

The operational status inspection found that the emergency preparedness program had been maintained in a good state of operational readiness. The emergency planning and coordination organization received good support from management and maintained an experienced and qualified staff. Emergency facilities, equipment, and supplies were maintained in an excellent manner. The licensee had trained an emergency response organization, of good staffing levels, that could be activated in a short period of time to respond to emergencies.

Quality assurance audits and surveillances in the functional area of emergency preparedness were performed in an effective manner. The licensee's corrective action system for both internally identified problems, as well as those identified by the NRC, was particularly responsive. The licensee maintained a good working relationship with state and local offsite response agencies and kept these agencies informed of the status of emergency planning and changes in the emergency plan.

In summary, the licensee's emergency preparedness program continued to maintain a good level of operational readiness for responding to emergencies. The licensee's emergency exercises were particularly challenging and were improved during this assessment period by using the control room simulator in the dynamic mode. In part, because of the challenge presented by the exercises, a number of weak areas were identified that required corrective action. Weaknesses were identified during walkthroughs performed to evaluate the operation crew's ability to implement the emergency plan. The emergency preparedness program had received excellent management support. The licensee demonstrated a proactive and responsive approach to the correction of weak areas and in the overall improvement of this functional area. Quality assurance audits were performed in an effective manner.

2. Performance Rating

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

3. Recommendations

a. Recommended NRC Action

Inspection effort in this functional area should include the core program, supplemented by regional initiatives, to review the actions implemented by the licensee to correct the identified weaknesses and provide enhanced assessment of the upcoming emergency preparednesses exercise.

b. Licensee Actions

Licensee management should take actions to implement proactive corrective actions for the identified weaknesses discussed above and to enhance its self-assessment capabilities.

E. Security

1. Analysis

This functional area consists of activities associated with the security of the plant, including all aspects of access control, security background checks, safeguards information protection, and fitness-for-duty activities and controls.

Evaluation of this functional area was based on the results of security and fitness-for-duty inspections performed by region-based inspectors and on an ongoing basis by the resident inspectors. The enforcement history in this functional area was notable in that only minor violations were identified, which did not indicate any programmatic weaknesses.

The previous SALP report recommended that the licensee emphasize prompt completion of corrective actions and continue proactive efforts in dealing with outage personnel who violate plant security requirements. During this assessment period, the licensee was prompt in completing corrective actions identified by internal audits and findings by NRC inspectors. The licensee implemented an excellent program for swiftly dealing with security violations by outage personnel. The program enhancement resulted in significant improvements concerning outage violations.

Comprehensive quality assurance, performance-based audits were completed. The audit team included nuclear security expertise from another utility. The security department management promptly corrected all audit findings and evaluated audit observations for program improvement. The quality assurance audit program was enhanced by providing audit personnel with several weeks of security training so they could be qualified as a security officer prior to conducting audits. In addition, audit personnel performed routine security duties in order to gain a detailed insight of the security program.

During this assessment period, security management demonstrated excellent professionalism, organizational talent, and a proactive attitude. The security force demonstrated superior attention to duty. During routine activities, the security force exhibited vigilance and responsiveness to routine duties and situations requiring their attention.

A well-staffed security force was maintained, with a low turnover rate. An excellent training program was established to ensure that performance was maintained at a high level.

The response to technical issues was excellent. The security management staff was proactive in seeking out problem areas associated with security. When identified, the problem areas, such as a computer outage, a false positive uranalysis test, and building shadows that affected assessment capabilities, received immediate attention.

The fitness-for-duty program satisfied the general objectives of the program. The program was well managed and implemented. The program strengths resulted in employees having confidence in the program.

In summary, a superior security program had been implemented. Management demonstrated strong support for the security program. The security staff was professional and well organized. Staffing, training, security systems, and security management were outstanding. Quality assurance audits and management responsiveness to audit findings were excellent. The enforcement history was superior.

2. Performance Rating

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

3. Recommendations

None.

F. Engineering/Technical Support

1. Analysis

This functional area consists of technical and engineering support for all plant activities. It includes all licensee activities associated with the design of plant modifications and engineering and technical support for operations and training.

This functional area was inspected on an ongoing basis by the resident inspectors and periodically by region-based inspectors. The inspection effort included team inspections to review the functional capability of the electrical distribution system and the licensee's systems entry and retest requirements. The enforcement history in this functional area was superior in that no violations were identified.

The previous SALP report recommended that management attention be provided to the area of training. During this assessment, improvements were seen in training; however, licensed operator training continued to need management attention and priority.

During this assessment period, an inspection pertaining to design changes and equipment modifications was conducted. Weaknesses were noted in the licensee's design change program relative to safety evaluations and a lack of documentation to verify the environmental qualification of replacement conduit seal assemblies. It was determined that the identified weaknesses were isolated cases and not indicative of programmatic problems. Overall, the design change packages were considered to be complete and the engineers were knowledgeable of the design change process. The licensee's snubber and pipe support programs were found to be comprehensive and well structured.

An electrical distribution system functional inspection was also conducted during this assessment period. This inspection identified a number of strengths and few weaknesses. The fuse control program was found to be well established and comprehensive and was considered to be superior. It was also noted that the licensee maintained good engineering drawings, which reflected the as-built condition of the plant. Interdepartmental communications and interfaces between the site engineering and the technical support groups were considered to be superior. However, program weaknesses involving inappropriate design inputs used in engineering calculations in both the electrical and mechanical areas were identified. Most of the design calculation problems were considered to be minor and did not affect the validity of the calculation. However, omission of water hammer considerations in the service water system evaluation was considered to be of more significance.

Based on the results of the systems entry and retest inspection, it was noted that the licensee developed and implemented a good program for determining the need for postmodification testing following the completion of permanent and temporary design changes and the type of testing to be performed. The responsibilities of the individuals involved with testing activities were well defined and the training and experience of the personnel, at all levels of

involvement, were good. The licensee was also noted to have an effective containment integrated leak rate test program. With the exception of problems associated with the testing of the reactor water cleanup system, the occurrence of personnel errors or procedure violations in the performance of test activities was rare.

The licensee's systems engineering program was noted to be effective during a number of inspections. The system engineers were actively involved in assessing equipment abnormalities, reviewing the results of system and component testing, and trending equipment performance. This was demonstrated throughout the assessment period by the cooperation and communications among systems engineering, maintenance, and operations personnel. Several instances were identified where the system engineers provided excellent support to the other organizations. There was one instance identified where a system engineer failed to adequately document the resolution to a test discrepancy.

At the end of the previous assessment period, the NRC was concerned that training resources for the licensed operator training program appeared to be marginally adequate. During this assessment period, some improvements were observed in this area. Most notable were the improvements in the training resources. The training staff was enlarged and a program to rotate licensed operators from the operations department to the training department was implemented. The training department also implemented a formal communications process between the operations and training department management staffs in an effort to improve training quality and focus. At the management level, this appeared to be working satisfactorily. However, as a result of operator interviews, there was some indication that the operator's observations and feedback to the training department were not being considered.

It was also noted that many of the licensee's initiatives for improving the training program were overdue. As an example, the first revision to the job task analysis, since initial accreditation in 1987, was not initiated until after a reaccreditation visit in June 1991. This delay contributed to a prolonged period of poor learning objectives, inadequate lesson plans, and a poorly defined training cycle content.

Ineffective management assurance of quality in the area of licensed operator training was evident. The priority, completion of development, and implementation of the training program have not been present. Several aspects of the training program remain undeveloped or unclear, such as, the amount of simulator time provided to the operators and the use and quality of job performance measures.

The licensee had comprehensive and effective programs in the areas of containment integrated leak rate testing, snubber and support inspections, and response to plant problems. It was noted that the licensee developed a permanent, onsite position for a general office engineering manager. Several onsite functions, such as drawing verification, were placed under control of this manager. This action was initiated to further improve communications and appeared to be successful.

Management of outage activities was very good overall. Design package approval timeliness was good. There were several minor incidences during the outage that indicated isolated deficiencies in design packages. Two occurred during control room upgrade because of inadequate assessment of the implementation of a design package and working in sensitive areas.

At the beginning of the outage, two reactor water cleanup system actuations occurred because the design engineer failed to consider the impact of lifting all leads and due to inadequate precautions for working in sensitive areas. Several incidents, at the end of this assessment period, related to the reactor water cleanup system indicated inherent system design problems.

Overall, the performance in this functional area was good. The electrical distribution system functional inspection identified many strengths and few weaknesses. The systems entry and retest inspection noted that the postmaintenance testing program was good. The systems engineering program was generally effective. Ongoing concerns were identified with the licensed operator training program. It did not appear that management has adequately addressed the concerns identified during previous assessment periods. The control of outage activities was satisfactory.

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 core inspection program, supplemented by regional initiatives in the areas of licensed and nonlicensed operator training and a review of engineering activities to establish the quality of implementation of engineering-related programs.

b. Licensee Actions

Licensee management should implement actions to correct the ongoing concerns identified with the licensed operator training program.

G. Safety Assessment/Quality Verification

1. Analysis

This functional area consists of all licensee review activities associated with the implementation of safety policies, including licensee activities related to exemption and relief requests and other regulatory initiatives. In addition, it includes licensee activities related to the resolution of safety issues, 10 CFR Part 50.59 reviews, safety committee and self-assessment activities, 10 CFR Part 21 activities, and 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.

Inspections performed during this assessment period included a review of the licensee's procedures and controls for reporting defects and noncompliances in accordance with 10 CFR Part 21 requirements, the internal audit program and its implementation, corrective action systems, and routine verification of site activities by the resident inspectors. A review of the enforcement history identified no violations in this functional area.

The previous SALP report recommended that the licensee evaluate whether a performance-based, versus compliance-based, quality assurance plan could be adequately implemented with existing resources. During this assessment period, substantial improvement was made in implementing performance-based QA activities.

Good management effectiveness, support, and involvement continued to be seen. Management effectiveness and assurance of quality were evident in the improvements and high performance level in the maintenance, maintenance training, security, and surveillance areas. However, management oversight and involvement in the areas of radiological protection, licensed operator training, and the performance of operations crews on the simulator needed additional attention.

The licensee established and implemented an excellent audit program that was comprehensive in its assessments and performance-based in its approach. The audit frequencies were noted to be fully consistent with the requirements of the Technical Specifications. Completed internal audit reports clearly defined the scope of the audits and findings. Responses to audit findings were noted to be timely, with appropriate actions being taken to correct problems and identify root causes. Enhanced audits were seen in the area of security, radiological protection, and chemistry. In some cases, the assessments of processes by QA audits lacked scope and depth in that the audits did not routinely verify all of the programs/systems used to document and disposition identified problems were sufficiently comprehensive. Overall, the internal audit program appeared to represent an area of strength in management effectiveness to assure quality.

Reviews noted that the self-assessment processes were good. The activities of the safety review group were noted to be a strength. The Nonconformance Report Overview Committee, which was specifically involved in the assessment and followup of conditions adverse to quality, was considered a strength. Some weakness in self-assessment in the area of emergency preparedness were identified.

However, a significant weakness in the licensee's corrective action process was identified in that a relatively high threshold exists for requiring items to be documented in a nonconformance report. The program lacked an adequate, documented method to identify a programmatic or procedural deficiency or an operational transient that did not result in an engineered safeguards actuation. These types of occurrences, requiring corrective action but not classified as a significant condition adverse to quality, have not been documented in the corrective action system. For example, a reactor feedwater pump ran to minimum speed unexpectedly during troubleshooting, resulting in a

reactor water level transient, and a nonconformance report was not generated. Even though no specific issues were identified that had not been provided to management, the lack of sufficient documentation of this these type conditions, resulted in the lack of tracking, trending, and independent assessments by the appropriate management and oversight groups, all the attributes of an effective corrective action process.

Management has continually demonstrated excellent reaction toward resolving issues identified by the NRC and other nonlicensee organizations; however, due to the high threshold of the corrective action reporting system, it was not apparent that management has been aware of all the potential deficient conditions that occur at the facility. For this reason, the licensee has not demonstrated a proactive posture toward identifying and resolving issues.

Some weaknesses were also identified in the effectiveness of the nonconformance report root cause process. In some cases, the scope and timeliness of the evaluation of deficiencies caused a delay in corrective actions to assure safety. A protracted root cause analysis of a 4160-volt breaker lubrication problem resulted in delayed corrective actions on safety-related breakers and a delayed reportability evaluation. The nonconformance report process does not require prompt evaluation of similar components that may have the same deficiency, but routinely allows a delay of an evaluation for the development of the root cause, which may take 30 days or more, since completion dates are routinely extended. Also, corrective actions to address repetitive reactor water cleanup system isolations have not been fully effective.

Based on inspection results, the licensee demonstrated good problem resolution from a safety perspective. Examples included the disposition of indications in the reactor pressure vessel head studs, investigation and resolution of increased identified leakage, management attention and evaluation of emergency safeguards features actuations during control room modifications, and resolution of cross-wired, local power range monitors.

Licensee safety evaluations associated with modifications to the facility were of moderate to high quality. Safety evaluations were complete, well documented, and addressed the modification from a safety perspective. The licensee had a good 10 CFR Part 50.59 safety evaluation process. The procedures and controls for implementation of 10 CFR Part 21 requirements were found to be well defined and satisfactorily implemented. The root cause analyses and corrective actions specified in licensee event reports appeared to be thorough and reasonable.

Overall, licensee management provided good assurance of quality. The internal audit program represented an area of strength. The self-assessment processes were effective and the safety review group and Nonconformance Report Overview Committees were considered to be strengths. The licensee demonstrated good problem resolution from a safety perspective, although some ineffective problem resolution was seen. A significant issue involving a relatively high threshold for items to be documented by a nonconformance report was identified which indicated management has not always been proactive in identifying potential safety issues. Management assurance of quality in the area of licensed

operator training, radiological controls, and licensed operator performance on the simulator were identified as weaknesses. Management assurance of quality in the areas of maintenance, maintenance training, surveillance, and security were identified as strengths. The licensee had an effective 10 CFR Part 50.59 safety evaluation process and generally continued to provide timely, complete, and technically supported safety assessments of proposed license actions.

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 include the core inspection program, with regional initiatives to review the licensee's corrective action programs.

b. Licensee Actions

Licensee management should take actions to encourage self-identification and documentation of deficiencies.

V. SUPPORTING DATA AND SUMMARIES

A. Major Licensee Activities

1. Major Outages

On October 17, 1990, a reactor scram occurred following a turbine trip as a result of electrical faults when a temporary elevator cable blew into the 345-kV power line. Reactor start up was performed on October 29.

On March 23, 1991, the plant was shut down to repair a leak on a feedwater check valve. The plant was returned to power on March 28.

On May 9, 1991, the plant was shut down to repair a leak on a core spray manual isolation valve. The plant was returned to power on May 10.

On August 1, 1991, the plant began end-of-cycle coastdown to the refueling outage. On October 4, the plant shut down for the refueling outage. Following Refueling Outage 14, a reactor start up was performed on December 15 and the plant reached full power on December 27.

2. License Amendments

During this assessment period, 12 license amendments were issued, including the extension of the license expiration date to 40 years from operating license issuance date. Only one emergency amendment was issued, indicating a proactive licensing organization. Six relief requests were granted, including three inservice inspection requests and one Code Case request. Six NRC generic letters were closed as a result of acceptable licensee responses to requested actions.

B. Direct Inspection and Review Activities

NRC inspection activity consisted of a total of 37 inspections for a total of approximately 4686 inspection hours.