# INITIAL SALP REPORT

## U.S. NUCLEAR REGULATORY COMMISSION
## REGION IV

## SYSTEMATIC ASSESSMENT OF LICENSEE PERFORMANCE

## INSPECTION REPORT NUMBER

## 50-482/92-99

Wolf Creek Nuclear Operating Corporation

Wolf Creek Generating Station

October 6, 1991, through October 10, 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 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 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 November 17, 1992, 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."

This report is the NRC's assessment of the licensee's safety performance at Wolf Creek Generating Station for the period October 6, 1991, through October 10, 1992.

The SALP Board for Wolf Creek Generating Station was composed of:

Chairman

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

Members

M. J. Virgilio, Assistant Director for Region IV & V Reactors, Division of Reactor Projects III/IV/V, Office of Nuclear Reactor Regulation (NRR)
L. J. Callan, Director, Division of Radiation Safety and Safeguards (DRSS), Region IV
D. D. Chamberlain, Deputy Director, Division of Reactor Safety (DRS), Region IV
A. T. Howell, Chief, Project Section D, DRP, Region IV
W. D. Reckley, Project Manager, Project Directorate IV-2, NRR
G. A. Pick, Senior Resident Inspector, Wolf Creek Generating Station, DRP, Region IV

The following personnel also participated in or observed the SALP Board meeting:

W. M. Hodges, Director, DRS, Region I
T. F. Westerman, Chief, Engineering Section, DRS, Region IV
J. L. Pellet, Chief, Operations Section, DRS, Region IV
M. A. Satorius, Project Engineer, Project Section D, DRP, Region IV
L. E. Myers, Resident Inspector, Wolf Creek Generating Station, DRP, Region IV
P. M. Ray, Operations Engineer, Performance and Quality Evaluation Branch, NRR
A. B. Earnest, Physical Security Specialist, DRSS, Region IV
L. T. Ricketson, Radiation Specialist, DRSS, Region IV
T. O. McKernon, Reactor Inspector, DRS, Region IV
C. A. Carpenter, Technical Assistant, NRR

## II. SUMMARY OF RESULTS

### Overview

Overall, licensee performance was good, with mixed performance results in some areas. Performance in the Plant Operations functional area was good. Operators performed generally well during routine plant operations, and their response to most plant events was good. Management involvement improved in this functional area as evidenced by improvements in the operator training program and licensee efforts to reduce the amount of nuisance annunciator alarms. However, several examples of operations department procedural weaknesses and operator inattention to detail were identified. Numerous discrepancies with operator logs were indicative of a need for increased management attention to this area. Maintenance/Surveillance performance also was good. The overall material condition of the plant continued to be very good, and few equipment problems resulted in plant transients. However, continuing problems in the area of work control have not been fully resolved.

Performance in the Radiological Controls area improved to a superior level of performance, and performance in the Security functional area remained superior. Performance in the Emergency Preparedness functional area was good, having declined from a superior level of performance. The inability of two out of three crews to recognize that emergency action level initiating conditions had been met for a scenario event was considered a significant weakness.

Performance in the Engineering/Technical Support area was good. Significant improvements in the licensed operator requalification training program were noted, and a detailed action plan had been developed to address significant motor-operated valve program weaknesses that were identified early in the assessment period.

Performance in the Safety Assessment/Quality Verification functional area remained acceptable, with continuing problems noted in the areas of self-assessment and corrective actions. Actions taken to develop a Performance Enhancement Program (PEP) to address weaknesses associated with the organizational structure, human performance, and plant programs were viewed as a positive initiative. However, the effectiveness of the PEP could not be evaluated during this assessment period because it had not been fully developed.

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

| Functional Area | Rating Last Period (07/01/90 to 10/05/91) | Rating This Period (10/06/91 to 10/10/92) |
|---|---|---|
| Plant Operations | 2 | 2 |
| Radiological Controls | *2I | 1 |
| Maintenance/Surveillance | 2 | 2 |
| Emergency Preparedness | **1D | 2 |
| Security | 1 | 1 |
| Engineering/Technical Support | 2 | 2 |
| Safety Assessment/ Quality Verification | 3 | 3 |

*I Improving Trend - Licensee performance was determined to be improving during this assessment period. Continuation of the trend may result in a change in the performance rating.

**D Declining Trend - Licensee performance was determined to be declining during this assessment period and the licensee had not taken meaningful steps to address this pattern. Continuation of the trend may result in a change in the performance rating.

## III. CRITERIA

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.

## 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.

NRC inspection efforts consisted of the core inspection program by the resident inspectors and a regional initiative to review plant procedures.

The previous SALP report (NRC Inspection Report 50-482/91-99) noted that operators responded well to plant events and maintained a superior continuous operating history. Enforcement history was good, and staffing levels remained

good with the exception of operations support staffing. The effectiveness of licensed operator requalification training was marginal, with continuing weaknesses noted in emergency operating procedure implementation. Examples of operators failing to properly document known problems were also identified. This was attributed to a lack of sufficient management guidance and direction in this area. The previous SALP recommended that the licensee continue to: evaluate and enhance communications between operations and the other departments; provide additional support to operations and various support activities; conduct self-critical assessments of plant operations; and ensure that appropriate issues are being identified for resolution.

The enforcement history and reportable events in this functional area were indicative of a good level of performance. However, problems with procedural adequacy and compliance and several instances of inattention to detail were noted. For example, because of inadequate procedural guidance, licensed operators overpressurized the positive displacement pump discharge piping, and an auxiliary operator failed to perform certain steps in a procedure, which diluted the containment spray additive tank.

Operator performance during routine plant operations was very good, but operator responses to plant events were mixed. During power operations, operators responded quickly and in accordance with approved procedures to an inadvertent main feedwater regulating valve closure. During a loss of nonvital power, operators recognized the event quickly but were slow to evaluate the failed steam generator water level instrument and select an alternate channel prior to the reactor trip. An operator over-reacted to a high average temperature by increasing main turbine load too quickly and, subsequently, reduced reactor coolant system (RCS) pressure below the administrative limit for departure from nucleate boiling, requiring automatic system response to restore pressure.

The level of housekeeping throughout the plant was very good. Few equipment problems challenged the operators.

Throughout the assessment period, there were several problems caused by operator inattention to detail. A lack of awareness of clearance order status by operators and test engineers resulted in contaminating a room because of an open vent valve. Operators inadvertently removed the control room ventilation system from its safeguards lineup, and an operator failed to log axial flux readings as required by procedure.

During this assessment period, procedural weaknesses were identified with plant operating procedures (general, system, emergency, and alarm response). For example, weaknesses in a general plant operating procedure resulted in the inoperability of both centrifugal charging pumps while the plant was operating in Mode 4. During plant and emergency operating procedure inspections, programmatic weaknesses were noted in several procedural control areas, including documentation, the temporary procedure change process, revision

implementation, and the procedure writers guide. In response to the plant operating procedural weaknesses, the licensee has begun to implement a long-term procedure upgrade program.

The licensee has taken steps to improve training effectiveness. The Operations and Training Departments established formal communications at several levels. At the end of each requalification training week, the shift supervisor for that crew and the operations training supervisor discussed the topics covered during the week to identify any needed improvements. The Operations and Training Departments agreed upon the operator training needs instead of the Training Department identifying the course topics.

The overall level of operator professionalism and decorum was good. Shift turnover briefings were thorough. Operators routinely referenced alarm response procedures when responding to control room annunciators. The licensee implemented steps to reduce control room traffic by placing a rope barrier across the entrance to the control room and required licensed operator permission to enter. However, on a number of occasions operator communication lacked formality.

The effectiveness of the assurance of quality and the resolution of technical issues was mixed. For example, the licensee identified that an inadequate off-normal procedure resulted in a Technical Specification violation, and effective corrective actions were promptly taken. Licensee actions to resolve a number of problem areas following a February 1992 reactor trip were thorough and effective. On the other hand, operations management was slow to realize the scope and causes of numerous examples of operator log discrepancies. Operations department management did not take effective actions to identify and correct the causes of these log discrepancies until NRC and licensee quality assurance personnel identified similar discrepancies.

Operations staffing was good. Operations support staffing had not changed significantly from the last assessment period. The licensee plans to augment the support staff with additional personnel after they complete licensed operator training and become licensed.

The overall level of management involvement in this functional area was good and improved throughout the assessment period. Senior licensee management was more involved in the day-to-day operation of the plant, and there was increased management visibility in the plant. The licensee enhanced communications among work groups and the control room operators by implementing a work group turnover with the shift supervisor. The licensee significantly reduced the number of main control board deficiencies and nuisance alarms during the assessment period. The licensee began to implement the Management Action Plan (MAP) and began to develop the PEP to address identified problem areas. Several of the MAP and PEP actions are intended to correct weaknesses associated with this functional area.

In summary, licensee performance in the area of Plant Operations was good. Operators responded well to most plant events and usually operated the plant

well during normal operating conditions. Overall, staffing levels remained good and actions were being taken to increase the operations support staffing. The licensee began addressing weaknesses in this area as a result of implementing the MAP and developing the PEP. However, weaknesses continued to be identified in the areas of procedural adequacy and operator attention to detail. Management oversight and involvement improved throughout the assessment period as evidenced by a number of positive initiatives.

2. Performance Rating

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

3. Recommendations

None

B. Radiological Controls

1. Analysis

This functional area consists primarily of activities related to radiation protection, radioactive waste management, radiological effluent control and monitoring, radiological environmental monitoring, and transportation of radioactive materials.

This area was inspected five times by Region-based radiation specialist inspectors and on a continuing basis by the resident inspectors.

The previous SALP report recommended that management assess the as low as reasonably achievable (ALARA) suggestion program to assure that the program is fully utilized. The report also recommended that management evaluate the adequacy of the radiation protection technician training staff.

Management provided strong support to the radiation protection program during this assessment period as evidenced by increased staffing and budget allocations. The increased use of computer technology for task tracking and information sharing demonstrated a high level of management commitment. Management support was also evident by the high number of supervisory and professional staff that attended offsite training and professional meetings. Management implemented a program awareness initiative which included required tours of the radiological controlled area by radiation protection supervisors. The supervisor inspection program was effective because it identified potential problems and increased the awareness of radiation protection supervisors to conditions within the radiological controlled area.

Radiation protection procedures provided good program guidance and were enhanced so as to remove inconsistencies identified during the previous assessment period. The radiological occurrence reporting system functioned well to identify occurrences, trend causes, and track corrective actions. The

radioactive materials controls and contamination programs were strengthened by the installation of new personnel contamination monitors. The radiation protection group performed an excellent investigation of a personnel hot particle exposure event. The investigation identified probable causes and resulted in special training for radiation workers in order to avoid future problems.

The percent of contaminated areas within the radiological controlled area was low, and radiological housekeeping was generally good. The radiation work permit program was effective and provided good instructions to radiation workers. Worker adherence to radiation work permit requirements was good. Locked high radiation areas were properly controlled.

All elements of the internal radiation exposure control program, including air sampling, respiratory protection, and whole body counting, were of good quality. Engineered controls such as portable ventilation and ambient air fit testing equipment were used to enhance the internal exposure program.

Management provided strong support for the ALARA program. This was demonstrated by the President and Chief Executive Officer attending ALARA committee meetings. Another example of management support for the ALARA program involved the approval of budget items for implementation of plant modifications which were justified by a dose-saving-versus-cost analysis. Some of the ALARA initiatives were completed during the 1991 refueling outage, others were planned to be completed in the 1993 refueling outage, and the remaining are scheduled for completion over several years. The ALARA initiatives which were approved for future implementation included shielding improvements for the regenerative heat exchanger, new steam generator nozzle dams, a reactor head stand shield, and a permanent steam generator bowl drainline. An ALARA initiative task which should result in significant long-term dose savings was accomplished during the 1991 refueling outage and involved the removal of the resistance temperature detector bypass piping. The licensee's person-rem values for the period 1988-1992 were well below the national pressurized water reactor average. The ALARA suggestion program gained increased acceptance from the workers through a recently initiated incentive program, but it remained only modestly productive.

Overall implementation of radiological controls procedures and practices was good. However, during the first half of the assessment period, several implementation weaknesses were identified. For example, radiological postings were not always maintained in a proper manner to ensure that personnel were aware of radiological conditions. On some occasions, personnel were observed to have leaned over radiation barriers during the conduct of maintenance activities.

An excellent liquid and gaseous radioactive waste effluent program was implemented. Radionuclides released in liquid and gaseous waste effluent, and doses calculated from the effluent, were within the Offsite Dose Calculation Manual limits. Semiannual Radioactive Effluent Release Reports were submitted in a timely manner and contained all the required information in the required

format. Two violations were identified that pertained to inadvertent radioactive gaseous releases that were caused by an inadequate waste gas system operating procedure. Several inadvertent radioactive gaseous releases were identified in the previous assessment period. This represented a continuation of performance problems in this area.

An excellent radiological environmental monitoring program was maintained. The program was well managed and included good implementing procedures. The annual land use census was properly performed and documented. The annual radiological environmental monitoring reports contained the required information and were submitted in a timely manner. The environmental sampling stations and equipment were well maintained. A strong meteorological monitoring program also was maintained.

Superior solid waste and transportation programs were implemented. A state-of-the-art computer code was used to classify and characterize radioactive waste, and shipments were made without incident or problem.

Overall, staffing in the Radiological Controls area was maintained at an appropriate level. Staffing for the ALARA program was noted to be minimal during the early part of the assessment period with the ALARA coordinator being the only individual responsible for the program during routine operations. Later in the assessment period, three full-time ALARA technicians were added to the program. The solid radwaste and transportation program had a minimum number of personnel but obtained excellent results. The staffing to process radiation work permits was acceptable during routine operations. The licensee's staff was supplemented with contract radiation protection technicians during outages, but reliance was not placed on contractor personnel for normal operations.

A good radiation protection technician training program was in place. The training sessions were presented by well-qualified training department instructors. An excellent training program had been implemented for personnel responsible for radioactive waste effluent management. Mockup training or rehearsals were conducted for several jobs performed during the 1991 refueling outage. Staffing in the technician training group had increased, but this came at the expense of the corporate training group, which was responsible for general employee and radiation worker training and was challenged during the 1991 refueling outage. A good program had been implemented for evaluating and screening prospective contractor radiation protection technicians.

Comprehensive audits were performed in the radiological controls area by the licensee's quality assurance group. The audits were performed by qualified individuals and usually included technical experts from other nuclear power plants. The radiation protection organization responded promptly to the audit findings with effective and timely corrective actions. In addition to the routine quality assurance audits, a vendor performed an assessment of the waste management and transportation programs.

In summary, a superior radiation protection program had been implemented. Management and worker support for the ALARA program had increased. Several excellent ALARA initiatives were identified and approved. Excellent programs were maintained in the areas of radwaste management, transportation, radiological environmental monitoring, and radioactive effluent controls. Minimum staffing was noted in some areas, but, overall, proper staffing levels of well-trained personnel were maintained. An effective audit program had been implemented.

2. Performance Rating

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

3. Recommendations

None

C. Maintenance/Surveillance

1. Analysis

This functional area consists of activities associated with the preventive and corrective maintenance of plant structures, systems, and components. This area also includes the conduct of surveillance testing, welding activities, and inservice testing (IST) and inspection (ISI) activities.

This area was inspected on a routine basis by the resident inspectors and on several occasions by Region-based inspectors. The Region-based inspections included inspection of the maintenance program implementation, surveillance testing and calibration control programs and implementation, a fuel integrity and reactor subcriticality inspection, inspection of the implementation of the boric acid prevention program, surveillance test procedures and records inspection, inspection of the IST program, and an ISI program inspection. A special inspection was conducted at the end of the assessment period to review the circumstances surrounding a degraded essential service water flow condition.

The previous SALP report noted that equipment continued to perform well. The licensee was very effective in identifying the causes of personnel errors committed during the implementation of the surveillance program and in improving controls over the maintenance troubleshooting program. Staffing levels were appropriate to assure timely completion of maintenance and surveillance activities. The previous SALP recommended that licensee management should increase its efforts in establishing more effective work process implementation controls because of continuing weaknesses noted in work control, coordination, and surveillance scheduling activities. The SALP report also recommended that the licensee should continue to implement its commitment to enhance the maintenance program, the root cause analysis of equipment problems, and IST implementation effectiveness.

During this assessment period, the enforcement history and reportable events related to this area were indicative of continuing weaknesses in the area of work control. Other violations of lesser safety significance also were identified.

The conduct of preventive and corrective maintenance activities was usually good. The activities were implemented by qualified personnel. The maintenance, modification, and instrumentation and controls groups maintained a strong, qualified staff. Generally, personnel implemented the work in accordance with procedures. However, continuing problems in the area of work control were indicative of a need for increased management attention. For example, maintenance personnel corrected an interference on a boric acid tank reach rod valve without an approved work request. During conduct of preventive maintenance on a manually operated essential service water (ESW) system valve, mechanics adjusted the valve position indicator without work authorization and failed to document this activity. The valve position indication adjustment was not properly performed. As a result, the valve was locked in the incorrect throttle position, which caused a significant degradation of ESW flow to a component cooling water heat exchanger.

Overall, the material condition and the level of housekeeping in the plant were good. Few equipment problems resulted in unnecessary challenges to the operators. However, some recurring equipment problems were identified. Examples included the rod control system, plant computer, an emergency diesel generator thermostatic control valve, and a safety-related battery charger. Some long-standing system design problems have caused nuisance alarms in the control room. For example, component cooling water temperature sensitivity and flow problems which were identified in 1985 and 1988, respectively, have not been corrected. The corrective maintenance backlog has been increasing throughout the assessment period, but the significance of this increasing backlog had not been fully evaluated by the end of the assessment period.

The surveillance test program was considered to be strong. The licensee appeared to be proactive in upgrading the surveillance testing control process and had initiated improvements in the surveillance testing database. The calibration control program was good and had been well documented and coordinated. The administrative controls in place for scheduling and tracking surveillance testing activities appeared to be good. Surveillance test procedures contained the appropriate elements and generally satisfied the Technical Specification requirements.

The implementation of surveillance and testing activities was generally good, but declined from the high level noted during the previous assessment period. Several examples of missed or inadequately performed surveillances were identified. For example, an emergency diesel generator (EDG) surveillance was not performed within the specified surveillance interval because of weaknesses in the administrative controls governing increased EDG surveillance testing. A similar issue was identified during a previous assessment period. In another instance, the failure to incorporate changes into a nuclear instrumentation calibration procedure caused instrumentation and

controls (I&C) technicians to incorrectly adjust an intermediate range monitor following the fifth refueling outage. In addition, several instances were noted during the assessment period in which I&C personnel were observed to be working around minor procedure deficiencies, rather than stopping work and correcting the procedures.

Implementation of the IST program was found to be generally satisfactory. The licensee had previously recognized that weaknesses existed in the IST program and, as a result, committed to perform a complete review of IST procedures to ensure technical adequacy and compliance with American Society of Mechanical Engineers (ASME) Section XI Code requirements. The licensee also obtained an independent review of the IST program by an engineering consulting firm. Additional program issues requiring resolution were noted during the licensee review, which licensee personnel committed to include in the IST procedure review. A weakness was, however, identified by NRC pertaining to the use of a differential pressure gauge which did not conform to ASME Section XI Code range requirements. Licensee personnel became aware of this discrepancy in early 1991 and had taken steps to replace the instrument. The condition was not, however, documented in accordance with corrective action program requirements.

ISI data from the fifth refueling outage was found to be consistent with ASME Section XI Code and ISI program requirements. The organization of the ISI data in clearly identifiable files containing applicable examination results, equipment calibration records, and personnel certifications was considered a document control program strength. Welding activities associated with the resistance temperature detector thermowell system modification to the reactor coolant system were noted to be well planned, executed, and documented.

The licensee's program for boric acid corrosion prevention was found to generally meet the intent of Generic Letter 88-05, "Boric Acid Corrosion of Carbon Steel Reactor Pressure Boundary Components in PWR Plants." The program included an extensive list of components inside containment being checked for boric acid leakage. However, the licensee omitted from the program components outside the containment that were part of the reactor coolant pressure boundary. In addition, the program's requirements for engineering evaluations of boric acid leaks were limited in scope in that evaluations did not assess the in-plant locations where conditions could cause high concentrations of boric acid or other observed degradation. While the licensee was utilizing the work request process to correct boric acid leaks, it was observed that no boric acid leakage conditions had been submitted to engineering for evaluation since the inception of the program.

Management involvement in the assurance of quality in this area was mixed. For example, the licensee has been successful in resolving the surveillance problems that were identified during the previous assessment period. Licensee management has taken steps to develop a reliability-centered maintenance program and to further enhance the predictive maintenance program in order to improve the overall effectiveness of plant maintenance. On the other hand, the licensee has been less than fully successful in identifying the causes of

and correcting problems in the work control area. A number of maintenance and surveillance procedural weaknesses were identified throughout the assessment period; however, no meaningful corrective actions associated with addressing the generic implications of these procedural weaknesses had been initiated during this assessment period.

In summary, licensee performance in this area continued to be good. Equipment continued to perform well, with some exceptions noted. Some weaknesses were identified in the implementation of surveillances. Work control problems continued to be identified during this assessment period. Previously identified concerns with the IST program had not been fully corrected prior to the end of the 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 be consistent with the core inspection program, with regional initiatives in the areas of work control, planning and scheduling, and the backlog of corrective maintenance work requests.

b. Licensee Actions

The licensee should assess work control effectiveness and take those actions, as appropriate, to correct identified weaknesses.

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 exercise and actual events that test the emergency plans, and interactions with onsite and offsite emergency response organizations during planned exercises and actual events.

Evaluation of this functional area was based on the results of two inspections conducted by regional emergency preparedness analysts and observations by the resident inspectors. The two inspections included evaluation of the 1992 emergency exercise and an operational status inspection which also included the regional initiative to inspect dose calculation and assessment.

The previous SALP report noted a Performance Category 1 rating, with a declining trend. Problems were identified with the failure of shift crews to make accurate offsite dose assessments, several emergency exercise weaknesses, and poor internal reviews of changes made to the emergency plan. Recommendations for licensee action included training shift crews and evaluating dose assessments capabilities.

During the assessment period, there were no emergency declarations associated with actual events.

Licensee management demonstrated a commitment to maintain an effective emergency preparedness program. Improvements were made in emergency response facilities, including installation of new plant data computer terminals to upgrade the capabilities for data transfer. The emergency response facilities and equipment were maintained in an excellent state of operational readiness. Improvements were made in the emergency planning organization by moving more of the supervision and planning activities onsite from the Wichita, Kansas, office. The licensee continued to maintain good working relationships with state and local agencies.

During the 1992 exercise, the licensee's response demonstrated that it was prepared to protect the health and safety of the public. Control room personnel properly detected and classified emergency events. Their performance in identifying and following the correct procedures to mitigate the simulated accident was considered a strength. Excellent command and control was observed in the Emergency Operations Facility. The scenario permitted the demonstration of all exercise objectives and the verification of the effectiveness of corrective actions for weaknesses identified during the previous exercise. One weakness was identified during the 1992 exercise relating to delays experienced in making initial notifications of an emergency to the state and county and in activating the group pagers so that emergency response personnel could be recalled to activate emergency response facilities.

Walkthroughs conducted with shift crews during the operational status inspection revealed three weaknesses. The most significant weakness involved two out of three crews that failed to recognize that emergency action level initiating conditions had been met for a scenario event. Improvements were noted in the response activities of the health physics and chemistry technicians in the control room environment under emergency conditions.

The operational status inspection determined that the licensee's emergency response training program provided comprehensive training to members of the emergency response organization. A good level of staffing had been maintained for the emergency response organization. Audits performed in the emergency preparedness area were comprehensive and performance oriented. The emergency response organization effectively responded to the audit findings. A regional initiative inspection performed in the area of dose calculation and assessment found that a new computer based method for calculating offsite dose projections improved the licensee's capabilities in this area.

In summary, the licensee's performance in this functional area was good. An effective emergency preparedness program was maintained throughout the assessment period. Management demonstrated superior support for the emergency preparedness program. Maintenance of emergency response facilities was excellent and several improvements were noted. Implementation of the emergency plan during the annual exercise was effective; however, some problems with emergency plan implementation were identified during operational walkthroughs. The failure of two shift crews to recognize that emergency action level initiating conditions had been met for a scenario event was considered a significant weakness. Overall, the licensee demonstrated an effective capability to protect the health and safety of the public during emergencies.

2. Performance Rating

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

3. Recommendations

None

E. Security

1. Analysis

This functional area includes activities that ensure security of the plant, including all aspects of access control, security background checks, and protection of safeguards information.

Evaluation of this functional area was based on the results of one routine security inspection performed by regional physical security specialist inspectors and observations by the resident inspectors.

The previous SALP report noted that licensee management demonstrated a strong commitment to the implementation of the security program. The security force staffing, training, and enforcement history were considered superior. No specific recommendations were included in the previous SALP report.

No enforcement issues were identified during this assessment period, which was indicative of continuing superior performance.

Management continued to provide strong support to ensure that a high quality, effective security program was maintained during this assessment period. Management support was evidenced by several security program upgrades. The upgrades included replacement of some intrusion detection equipment, installation of several additional assessment aids, and the modification of alarm system multiplexers to reduce the need for compensatory measures during system outages. The installation of system upgrades was well-planned and coordinated so as not to disrupt the routine security program or the conduct

of plant operations. Excellent communications and cooperation between the security staff and the operations staff ensured that the appropriate operational safety and safeguard interfaces were maintained.

High quality reporting procedures were maintained and understood by security supervisors. In-depth analyses of the event reports were conducted to determine root causes. A proactive approach was taken to correct any degraded security systems.

The security organization received excellent support from the I&C department. Five I&C technicians were assigned to the security organization to repair, replace, and test security equipment. A formal and highly effective preventive maintenance program was in place for the security systems. Repairs of security equipment were generally accomplished within hours after the identification of equipment problems. The rapid maintenance response to problems resulted in very few compensatory postings of security officers.

During the assessment period, the licensee submitted two changes to the Physical Security Plan, one change to the Safeguards Contingency Plan, and one change to the Security Training and Qualification Plan under the provisions of 10 CFR 50.54(p). The revisions were technically sound and reflected well developed policies and procedures. It was evident that security personnel involved with submitting plan changes performed thorough reviews of the proposed changes and were knowledgeable of NRC requirements.

The security manager and supervisors were well-trained, highly qualified, security professionals with an excellent understanding of nuclear plant security objectives. A stable staff of security officers was maintained with a low personnel turnover rate. The number of security officers per shift was adequate to ensure that the licensee complied with all security requirements.

The security training program was administered and implemented by a well qualified, full-time training staff. The training program included training activities that exceeded minimum NRC training requirements. Security personnel were provided with a well maintained physical fitness room, a simulator for training alarm station operators, and state-of-the-art training aids for hands-on training. In addition, security management and supervisors instituted a tactical training program for armed security force members. Security force members observed performing their duties exhibited a professional demeanor and were very knowledgeable of security program procedures and their job responsibilities.

An excellent audit of security program activities was performed by the licensee's quality assurance group. The audit was comprehensive and performance oriented and included a technical expert from another nuclear plant on the audit team. The security organization provided timely, effective, and technically correct responses to the audit findings and recommendations.

In summary, the licensee continued to maintain a superior security program. Management support for the security program was evident by several upgrades made to security systems and equipment, as well as all areas of the day-to-day security operations. The security training program and facilities were excellent. The security program was implemented by a well-trained, stable staff. A high quality security program audit was performed.

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; engineering and technical support for operations, outages, maintenance, testing, surveillance, and procurement activities; training; vendor interface activities; and configuration management.

This functional area was inspected on an ongoing basis by the resident inspectors and periodically by the region-based inspectors. The inspection effort also included team inspections to assess the motor-operated valve program and electrical distribution system.

The previous SALP report recommended that the licensee take aggressive actions to correct weaknesses in the engineering/technical support area and provide system-specific training for system engineers and general training on the design engineering process.

Enforcement history indicated generally good performance; however, one significant issue pertaining to a failure to meet a commitment to formulate a motor-operated valve program was identified by NRC.

The program developed by the licensee to implement commitments to Generic Letter 89-10, "Safety-Related Motor-Operated Valve Testing and Surveillance," was assessed as ineffective early in the assessment period. The program did not address many of the important provisions of the generic letter and lacked formality as typified by governing procedures that were superficial and incomplete. The program failed to acceptably demonstrate the operability of many of the plant's motor-operated valves. Management oversight and support was weak in this area. In response to NRC findings, the licensee extended a refueling outage to implement an aggressive corrective action program that

involved many motor-operated valve modifications and utilized the expertise of a large number of contractors. The reconstructed motor-operated valve program was detailed, well proceduralized, and comprehensive. By the end of the assessment period, the licensee had a well-conceived plan to address all remaining identified weaknesses in the motor-operated valve program, which when implemented should insure that the program will meet the intent of Generic Letter 89-10.

An electrical distribution system functional inspection (EDSFI) was conducted during this assessment period. The EDSFI evaluated the capability of providing necessary electrical power to required equipment during normal, upset, and accident conditions. The EDSFI found the overall design of the electrical systems to be superior. The availability of detailed design documentation was a strength. However, NRC identified weaknesses with the lack of documentation to support operability and with the control and update of information contained in the Updated Safety Analysis report.

The licensee has continued to maintain a strong fire protection/prevention program. The program was under a single person (Fire Protection Coordinator) who was knowledgeable and experienced. Procedures were well maintained, up to date, and followed applicable administrative requirements. Fire brigade training was maintained up to date and met all program requirements. Fire brigade equipment was well maintained and readily accessible. Plant fire protection systems and equipment were subjected to surveillance tests in accordance with the program requirements. Quality assurance was involved in the program, and engineering support was strong. The licensee had a designated fire protection engineer on site and one in the Wichita office.

The licensee realigned their engineering organization, developing in the process a system engineering department. The licensee has been slow to implement a formal system engineer program; however, the licensee expects to have 41 fully qualified system engineers by August 1994. NRC was unable to assess the effectiveness of the system engineer program because it had not been fully implemented by the end of the assessment period. However, in consideration of a recommendation made in the previous SALP report, the licensee had formulated plans to provide system-specific training to the system engineers. The licensee also announced that they will transfer the support service and engineering staffs from the headquarters offices to the site by early 1995.

During this assessment period, the engineering organizations demonstrated mixed performance in support of plant operations. For example, the engineering organization provided strong support for the refueling outage, which included effective technical control of unexpected work items including a failed fuel rod, component cooling water heat exchanger manway leakage, and leakby of the boron injection tank inlet bypass valves. On the other hand, engineering did not determine in a timely manner that two safety-related motor-operated valves in the emergency core cooling system were inoperable. Several incorrect fuses were installed in plant equipment because I&C technicians had relied on incorrect vendor drawings instead of accurately

maintained engineering drawings. The architect-engineer had failed to update applicable drawings for vendor equipment when a change to the equipment design occurred. In response to this problem, the licensee developed a fuse control program.

The modification and temporary modification processes were observed to be properly functioning. These programs contained all the essential configuration control elements. The licensee initiated actions to reduce the backlog of plant modifications. These actions included improved coordination, scheduling, and prioritization.

On two occasions, engineering performed effective evaluations to determine the 10 CFR 21 reportability of manufacturing defects. In each case, the engineering organization properly evaluated the safety significance and reportability of the identified discrepancy and made timely notifications to the material supplier when necessary.

The licensee's program for licensed operator requalification had been evaluated as unsatisfactory by the NRC during the fall of 1990. Through gradual improvement, the licensee has been able to return the program to a satisfactory status, as determined by a second NRC evaluation (with further improvement noted in a third evaluation conducted October 19-28, 1992). During this assessment period, the licensee developed and implemented new initiatives to improve the conduct and content of licensed operator training and evaluation. Specifically, notable improvements were observed in licensed operator training and examination materials. In addition, the licensed operators were observed to have conducted on-the-job training, with strong emphasis on effective communications. The licensee's program for technical support staff training was providing adequate initial and continuing training; however, some programmatic weaknesses were identified. The program had not been evaluated or audited by management, quality assurance, or any other organization.

In summary, performance in the area of engineering/technical support was good. Gradual improvement was evident in the training of licensed operators; however, a number of programmatic weaknesses were identified in the area of technical support staff training. The licensee was in the process of developing a system engineer department to be staffed with 41 system engineers, each of whom will receive system-specific training. The motor-operated valve program, which had lacked management attention and was fundamentally unacceptable when first inspected, was successfully reconstructed in response to NRC findings. The EDSFI found the overall design of the electrical systems to be superior. The licensee continued to maintain a strong fire protection program. Engineering support of plant operations was strong in some areas, weak in others.

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 be consistent with the core inspection program, with regional initiatives in the areas of engineering organizational structure, the system engineer program, the design basis capture program, and the plant modification backlog.

b. Licensee Actions

None

G. Safety Assessment/Quality Verification

1. Analysis

This functional area includes licensee activities associated with the implementation of licensee safety policies; licensee activities related to amendment, exemption, and relief requests; responses to generic letters and bulletins; the resolution of safety issues and performance of safety evaluations; safety committee and self-assessment activities; analysis of industry operational experience; licensee activities related to the identification and resolution of equipment and programmatic problems; and licensee activities associated with quality verification functions.

This area was routinely inspected by the resident inspectors and periodically by Region based inspectors. Regional initiative inspections included the review of the fuel integrity and subcriticality program, the motor-operated valve program, and the licensee's programs associated with self-assessment, feedback of operational experience, quality verification, and corrective actions. A reactive inspection was conducted to review the licensee's response to the "noise events" which occurred in February and March 1992.

The previous SALP report noted strengths in the areas of licensing submittals and quality verification audits. Weaknesses were identified in the areas of corrective action programs, licensee self-assessment capabilities, the licensed operator requalification program, and management involvement and oversight.

During this assessment period, there were eight license amendments issued. The amendment related to the reactor protection system manual trip switches was processed under emergency circumstances and an amendment request related to the Kansas Gas and Electric/Kansas Power and Light merger which was ultimately withdrawn was initially processed under exigent circumstances. The licensee's handling of these special requests as well as the quality of the routine amendment requests demonstrated a good knowledge of the regulatory process. The licensee also provided good responses to NRC generic letters and bulletins issued during the assessment period. In addition, topical reports related to the development of licensee inhouse capability to perform nuclear

design and safety analysis have been submitted and are currently under review by the NRC staff. The technical quality of the submittals continued to be good and reflected strong engineering support and cooperation with the licensing activities.

Enforcement history indicated continuing significant weaknesses in the areas of self-assessment and corrective action. A Notice of Violation and a Civil Penalty were issued for the licensee's failure to take prompt corrective actions for safety-related motor-operated valve operability concerns. Several other violations of lesser safety significance were identified for inadequate corrective actions.

The licensee's program for the assessment and resolution of issues pertaining to industry operational experience was acceptable. However, several weaknesses were identified in the areas of review adequacy and timeliness of actions taken to resolve industry concerns. Recent procedural and organizational changes should enhance the effectiveness of the program.

The quality of the licensee event report submittals was generally good. However, in a few instances, the corrective actions did not address generic implications. Periodic NRC reviews of control room logs and reportability evaluation reports determined that the licensee's conservativeness in making reportability determinations improved throughout the assessment period.

The licensee programs associated with the evaluation of changes to the facility in accordance with 10 CFR 50.59 were determined to be good. Recent changes to the process resulted in improved evaluations and better coordination of the safety evaluations with other parts of the plant modification and procedure change processes. Issuance of a revision to the applicable corporate procedure was considered a positive step in attempting to increase the consistency of the evaluations performed by various licensee organizations.

The licensee's self-assessment capabilities remained acceptable, with some improvement noted during the assessment period. However, several weaknesses in the licensee's ability to conduct appropriate self-assessments were noted. A significant breakdown in the licensee's self-assessment capabilities pertained to several significant motor-operated valve hardware and programmatic problems that were discovered by NRC early in the assessment period. Many of the motor-operated valve program weaknesses were known by licensee workers, but were not appropriately assessed by licensee management; therefore, no meaningful corrective action was initially taken.

Overall, the licensee's implementation of corrective actions was acceptable. The licensee significantly enhanced the effectiveness of their licensed operator training requalification program. However, several examples of inadequate corrective actions were identified during the assessment period. For example, the licensee failed to implement timely corrective action to resolve long-standing essential service water system water hammer events and failed to replace a defective flow transmitter following a surveillance that

identified the deficient condition. Licensee actions pertaining to correcting problems related to procedural noncompliance, inadequate procedures, and inattention to detail were not fully successful during this assessment period. The licensee's actions in response to several issues indicated they were implementing improvements; however, these improvements had not yet fully resolved all the identified weaknesses.

The licensee's response to events was acceptable, with some improvement noted. An NRC special inspection was conducted to investigate an event involving a loud noise during plant heatup which occurred on February 28, 1992. The inspection team reviewed the licensee's incident investigation team's findings, attended meetings, reviewed related historical data, and observed related surveillance testing and data collection during a number of plant heatups. NRC concluded that the licensee had not investigated a similar event occurring before the February 28, 1992, event. However, their investigative methods following the February 28 event were considered good. The licensee's conclusion that the noise event was caused by mechanical binding of the RCS system during thermal expansion appeared to be supported by data and observations taken during a subsequent plant heatup.

Licensee quality verification activities were determined to be good. Reviews during various NRC inspections generally found the licensee's quality verification audits to have provided comprehensive and accurate appraisals of on-site organizations' activities and programs. On-site review committees were also found to be functioning as intended. They were found to provide a forum for discussing plant issues and to serve as means for assigning responsibility for followup actions.

A special team inspection of the licensee's corrective action programs was conducted late in the assessment period. The team determined that recently implemented changes to the corrective action program and procedures should improve the overall performance provided that the changes are fully accepted and implemented by the licensee's personnel. Improvements were noted in the reduction of the compartmentalized implementation of corrective action programs that had been observed in previous inspections, increased use of performance trending, additional training of employees regarding corrective action programs and root cause analysis, and an increased involvement of management in the routine oversight of plant activities. Some concerns were identified by the inspection team and internal licensee audits involving a continued reluctance on the part of many licensee personnel to utilize the formal corrective action programs. Since many of the program improvements and training were performed late in the assessment period, the level of success related to the changes could not be fully assessed.

The team also reviewed the licensee's Management Action Plan (MAP) and Performance Enhancement Program (PEP), which are major programs developed to enhance a variety of licensee programs and organizations. The MAP was developed in response to problems identified in previous internal and external evaluations of licensee performance, including past NRC SALP reports. The MAP was developed by the licensee and was being implemented within existing

facility organizations. Several specific improvements resulting from the MAP included an increased use of trending to identify programmatic concerns and the formation of an Issues Review Group to identify issues or programs requiring management attention or increased coordination between licensee organizations. The MAP process was considered to be responsive in providing an integrated evaluation of problems and increasing the management's involvement in plant activities. During the early stages of implementation of the MAP, the licensee determined that a broader improvement program was needed and the PEP was developed. The MAP issues will either be closed in accordance with the established procedures or will be incorporated into a PEP action plan.

The PEP was developed with the assistance of an outside management consultant and involved the identification of general areas of concern and the development of action plans to address each concern. As of the end of the assessment period, the licensee had developed the general concerns, assigned action team leaders, and was in the process of forming teams and developing action plans. The inclusion of a resources impact analysis to allow team members to estimate the time requirements for participation and either reschedule or reassign normal work activities was considered a strength of the PEP process. An employee survey including questions regarding management performance and communications was performed as part of the preliminary PEP development. Issues identified from the survey were being incorporated into the PEP action plans. The PEP is still in the developmental phase and its effectiveness will depend on the quality of the action plans and their implementation.

The licensee initiated several management and organizational changes throughout the assessment period that were intended to improve communications and cooperation and eventually improve the licensee's effectiveness. The licensee deleted a level of management and added a third vice president in order to strengthen the quality assurance organization. Because these management and organizational changes occurred late in the assessment period, their effectiveness could not be assessed.

In summary, the licensee's overall performance in this functional area was acceptable, with some improvement noted. However, several significant weaknesses with the self-assessment and corrective action programs were observed during the assessment period. Increased involvement and oversight by management in routine plant activities were observed. Many changes were either implemented or planned late in the assessment period; therefore, the effectiveness of these changes could not be evaluated.

2. Performance Rating

The licensee is considered to be in Performance Category 3 in this functional area.

3. Recommendations

a. NRC Actions

Inspection effort in this functional area should be consistent with the core inspection program, with regional initiatives in the areas of self-assessment and corrective actions, and MAP and PEP implementation effectiveness.

b. Licensee Actions

The licensee should continue efforts to raise the level of acceptance of the corrective action program by the plant staff and begin implementation of effective PEP action plans.

V. SUPPORTING DATA AND SUMMARIES

A. Major Licensee Activities

1. Major Outages

The fifth refueling outage was completed on January 14, 1992. Although the outage was generally well controlled, extensive problems were encountered that extended the original planned 62-day outage to 117 days. Delays were principally the result of:

- Extensive NRC and licensee identified motor-operated valve deficiencies;
- Several failed fuel rods that required additional efforts to permit core off load;
- Unexpected problems in the cleaning and reassembly of component cooling water heat exchangers; and
- Difficulties in attempting to stop system leakage associated with the new boron injection tank inlet bypass valves.

Significant work completed included:

- Reactor Coolant Pump B motor replacement;
- EDG planned maintenance;
- RCS bypass manifold removal and installation of new resistance temperature detectors (RTD);
- Installation of new containment cooler coils;
- Installation of a new permanent reactor cavity seal;

- Sludge lancing, eddy current testing, and Inconel 600 plug replacement on two steam generators; and

- Motor-operated valve static testing.

2. License Amendments

Eight operating license amendments were issued.

3. Significant Modifications

The licensee installed 107 modifications during the assessment period. The following major modifications were installed:

- Reactor Cavity Seal Ring Replacement;

- RTD Bypass Manifold Removal;

- ESW Vault Installation;

- ESW Chemical Addition Modification;

- Radwaste Storage Modifications;

- Main Turbine Third Stage Extraction Steam Piping Modifications; and

- Snubber Removal/Replacement.

B. Direct Inspection and Review Activities

NRC inspection activity during the assessment period included 33 inspections. Approximately 4480 direct inspection hours were expended, which did not include Operator Licensing Examinations or contractor hours.