WOLF CREEK GENERATING STATION
SYSTEMATIC ASSESSMENT OF LICENSEE PERFORMANCE
Report 50-482/95-99

I. BACKGROUND

The SALP Board convened on October 17, 1995, to assess the nuclear safety performance of Wolf Creek Generating Station for the period April 10, 1994, through October 7, 1995. The Board was conducted in accordance with Management Directive 8.6, "Systematic Assessment of Licensee Performance." The Board members included: T. P. Gwynn (Board Chairperson), Director, Division of Reactor Safety; W. D. Johnson, Acting Deputy Director, Division of Reactor Projects; D. D. Chamberlain, Acting Deputy Director, Division of Radiation Safety and Safeguards; and W. H. Bateman, Director, Project Directorate IV-2, Office of Nuclear Reactor Regulation. This assessment was reviewed and approved by the Regional Administrator.

Functional Areas and Ratings:

	Current	Previous
Plant Operations	1	2
Maintenance	2	2
Engineering	2	2
Plant Support	1	2

II. PLANT OPERATIONS

Overall, performance in the operations area improved substantially during the assessment period. Excellent operator performance, improved material conditions, and strong management support contributed to a generally high level of performance. Plant management and personnel exhibited a clear safety focus.

The drain down event on September 17, 1994, demonstrated major weaknesses in the licensee's control of emergent work, procedural compliance, and operator understanding of the system configuration. Initial licensee response efforts were focused on preventing recurrence rather than a critical evaluation and assessment of the event significance. Strong corrective actions have subsequently addressed these weaknesses. As a result, the frequency and severity of operator errors declined significantly during the latter part of the evaluation period.

Operations management exhibited strong oversight, accountability and support throughout the period. Management expectations were emphasized with the operations staff daily in a manner that built pride and teamwork. As a result, operators clearly demonstrated their sense of plant ownership and personal accountability. The management commitment to improve the appearance and material conditions of the plant practically demonstrated the expectation that all plant personnel should work to the high level of professionalism of the operations department.

The strong operations program produced several improvements. Some of the more noteworthy examples included eliminating continuously illuminated control board annunciators, aggressive handling of operator work arounds, and operations involvement in daily planning of work in the second half of the period. Operators demonstrated effective reliance on procedures throughout the evaluation period with few problems. The operations staff exhibited strong and improved professionalism and communication techniques throughout the period. Although there were examples of ineffective communication and coordination with engineering and maintenance, efforts to improve communications have been made. This is an area where additional improvement is needed.

Control room operators performed well during routine operations and responded in an outstanding manner to plant challenges during the trip that occurred in March 1995 and the turbine control valve servo failure that occurred in September 1995. The low number of events during the period and the fact that the events that occurred were not due to personnel errors demonstrated a high level of performance. However, operations personnel need to continue to improve their attention to detail while performing their work activities and following procedures, as exemplified by the drain down event in September 1994. Other examples of this need for improvement include authorizing work simultaneously on both trains of the control room pressurization system early in the evaluation period, and permitting painting preparations to occur in both emergency diesel generator rooms concurrently in January 1995.

Operator training was effective and contributed to safe operations. The licensed operator initial examination results were very good, although minor communication inconsistencies were observed. The simulator scenario challenge has been significantly upgraded. Operations management's involvement during the dynamic simulator evaluation portion of operator requalification exams was a strength.

Operations department self-assessment and corrective action programs improved during the evaluation period. The operations department's commitment to improving performance was evident in the continued high number and low threshold of Performance Improvement Requests initiated by operators throughout the assessment period. Operator recognition and identification of problems were noted as strengths, but continued improvement was needed regarding the consistency and quality of corrective actions.

The performance rating is Category 1 in this area.

III. MAINTENANCE

Overall, safety performance in the maintenance area remained good. Management improvement plans initiated later in the SALP period had not yet shown results. The material condition of the plant was excellent. The continued implementation of an integrated plant scheduling process resulted in improved

outage performance with one major exception. Maintenance planning and the quality of maintenance work instructions continued to need improvement. The skill of the crafts remained high but worker adherence to instructions and procedures needed continued attention.

Management involvement and attention to the maintenance area increased toward the latter part of the assessment period. The new maintenance manager was cognizant of plant conditions and was taking action on the basis of strong, insightful self-assessment results. Maintenance management focus to achieve a high level of performance in the maintenance area was evident. Structural changes were undertaken to improve the maintenance planning process and to further enhance the interfaces between maintenance, operations, engineering, and integrated plant scheduling. These changes were recent and had not fully realized their potential.

The material condition of the plant was excellent. The numerous minor fluid leaks noted in the previous SALP had been eliminated. Major improvements were in progress with respect to the preservation of plant structures and components. The cleanliness and preservation condition of emergency diesel generators was particularly noteworthy.

Integrated plant scheduling continued to improve the coordination of maintenance support to the plant with a 13-week, look-ahead, risk-based scheduling process. This was particularly evident in the first application of integrated plant scheduling to a refueling outage. Nevertheless, an unplanned drain down of the reactor coolant system that occurred during the refueling outage highlighted a major weakness in the scheduling and control of emergent work. The scheduling and performance of surveillance testing remained strong.

Maintenance work procedures and instructions continued to need improvement. Work on the turbine-driven auxiliary feedwater pump highlighted this. In that instance, work plans failed to provide instructions for disassembly of electrical connections necessary to complete the work and caused workers to disassemble portions of the trip throttle valve actuator unnecessarily. In another instance, complicated work instructions confused the workers resulting in damage to the safety-related compression lugs on a breaker. Both NRC and the licensee identified instances where lessons learned were not incorporated in work instructions and problems were subsequently repeated. Changes were initiated near the end of the SALP cycle to enhance the effectiveness of work planning and to improve the quality of work instructions. Changes included the implementation of a centralized maintenance planning organization, an electronic work control system, qualification cards for work planners, and a formal process for building a work package.

The skill of the craft remained high and plant performance reflected a well trained maintenance staff. Nevertheless, procedure adherence by the craft needed continued attention. A recent example was the unauthorized work performed by an electrician on a fire damper. Quality control inspection of

maintenance work on two occasions did not independently verify acceptance criteria in use, resulting in minor damage to safety-related equipment. This indicated the need for additional attention to detail by the quality control inspectors.

The performance rating is Category 2 in the Maintenance area.

IV. ENGINEERING

Overall, safety performance in the engineering area continued to be good with increasing support for plant operations. In the early part of the period, weaknesses were identified in some programs and procedures. Late in the period, there were some isolated instances of incomplete information being provided to operations by engineering. Programs were put in place to enhance the performance of system engineers. Management demonstrated increasing effectiveness which resulted in the revitalization of an improving trend during the latter part of the assessment period.

Management attention to the performance of engineering increased during the period. The reorganization of engineering in April 1995 strengthened the organization by consolidating all the engineering functions. At the beginning of the period, design engineering was relocated to the site, and as a result, interdepartmental relationships within engineering have improved. Engineering management has been aggressive in the performance of self-assessments, reducing the engineering work backlog, and reducing the number of temporary modifications installed in the plant. Management expectations for engineering appear to be well understood by the engineering staff.

System engineering has continued to mature and, with management's reinforcement, the role of the system engineer has resulted in system engineering developing into a more effective support organization. A system engineer exchange program with the Callaway plant, as well as visits to other plants, was implemented. An extensive program to assure that the staff was trained and qualified has been implemented. System engineers have become an effective liaison between operations and design engineering.

Engineering was sometimes slow to react to issues or to grasp their significance. This was evident in the failure to take timely corrective action when a contractor identified the containment sump isolation valves as being susceptible to pressure locking. Closely related to this issue was engineering's occasional high threshold for formal recognition of issues.

Communication between engineering and operations, and within the engineering organization itself, was good. However, there were several instances where engineering communication with operations was not thorough, leading to poor engineering support of operations. Examples included starting the emergency diesel generator with an unacceptably high crankcase level, not providing information that would alleviate operator concern with emergency diesel generator starting air compressor oil levels, and not providing an appropriate reactor vessel cooling air return temperature alarm setpoint. Engineering's

oversight of contractors was generally good. Nevertheless, during steam generator tube testing, the oversight of the eddy current contractors was not well managed. Although efforts to become more involved in industry activities were evident at the end of the period, the completeness of response to industry experience information has been mixed.

Engineering procedures and maintenance of the licensing bases were acceptable; however, weaknesses were noted. Management failed to assure that employees consistently used existing procedures for event assessment, operability determinations, and corrective actions. Another weakness involved a lack of breadth in some 50.59 evaluations and the engineering analysis of some design modifications. Examples were also identified where engineering failed to properly translate design information into work instructions.

Many of the issues discussed above stemmed from weaknesses that were evident during the first year of the assessment period. Subsequent to an in-depth self-assessment, Wolf Creek management took effective corrective action during the last 7 months of the assessment period. Those actions revitalized the improving trend in engineering safety performance seen during the previous assessment period.

The performance rating is Category 2 in this area.

V. PLANT SUPPORT

Overall performance in the Plant Support area was superior during this assessment period, although performance in the emergency preparedness area continued to exhibit weaknesses during the biennial exercise.

Excellent performance was noted in the radiological controls area which consisted of activities related to radiation protection, chemistry, radioactive waste management, radiological environmental monitoring, and transportation of radioactive materials. Management oversight of work activities was good and good working relationships existed between the radiation protection department and other departments. Radiation protection personnel provided strong support during maintenance activities. Excellent control of radioactive materials and contamination were generally implemented, although personnel contamination events increased in the 1994 outage as compared to previous outages. A comprehensive ALARA program was in place and management and worker support for the ALARA program improved during the assessment period. Outstanding person-rem ALARA performance was achieved during non-outage periods. Implementation of new 10 CFR Part 20 was effectively accomplished. Excellent programs were implemented in chemistry, radioactive waste management, radiological environmental monitoring, and transportation of radioactive materials. Excellent training programs were effectively implemented.

Performance in the emergency preparedness area was improved but mixed. Improvements in emergency response facilities, event classification, offsite agency notifications, and emergency response training were noted. Other improvements included implementation of a 5-team emergency response organization and increasing emergency drill frequency from annual to quarterly. Sufficient corrective actions were taken to address a long standing problem involving emergency classifications. Performance during the biennial exercise continued to exhibit weaknesses although not as significant as in the previous biennial exercise. The similarity of some aspects of the weaknesses to those identified in the past indicates that corrective actions for past weaknesses were not fully effective.

Performance in the security area continued to be excellent with strong proactive management within the security organization and strong senior management support for the program. Excellent maintenance support ensured that the posting of security compensatory measures were kept to a minimum. An outstanding perimeter detection system supported by highly effective assessment aids was maintained. The Fitness-for-Duty and Access Authorization programs were effectively implemented.

Implementation of the fire protection program was generally very good. Fire protection procedures were concise and well written. Fire response equipment was well maintained and fire water pumps and equipment were operable and well maintained. Fire brigade staffing, equipment, and training were generally very good. A problem with the adequacy of emergency lighting in some areas was aggressively pursued by the licensee.

Housekeeping was excellent during the assessment period and plant appearance was improved in many areas where painting upgrades were completed.

Self-assessment was considered a strength in the plant support area, including audits, surveillances, and assessments. Corrective actions for identified problems were generally comprehensive and effective although corrective actions for weaknesses in the emergency preparedness area were not fully effective.

The performance rating is Category 1 in this area.