SYSTEMATIC ASSESSMENT OF LICENSEE PERFORMANCE REPORT
WOLF CREEK GENERATING STATION
50-482/97-99

I. BACKGROUND

The SALP Board convened on April 9, 1997, to assess the nuclear safety performance of the Wolf Creek Generating Station for the period October 8, 1995, through April 5, 1997. The Board was conducted in accordance with Management Directive 8.6, "Systematic Assessment of Licensee Performance." The Board members included: K. E. Brockman, Deputy Director, Division of Reactor Projects (Chairperson); A. T. Howell, Director, Division of Reactor Safety; 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
Operations	2	1
Maintenance	2	2
Engineering	3	2
Plant Support	2	1

II. OPERATIONS

Overall safety performance in the Operations area declined during this assessment period. Plant operations during routine activities and noncomplex events were generally good. No reactor trips were directly attributable to operator errors during this assessment period; however, operator errors did complicate the plant response during the January 1996 frazil ice event. In addition, instances of minor procedural violations and attention to detail were experienced throughout the assessment period. While operators continued to focus on maintaining an overall high level of control room material condition, they accepted a number of inappropriate Technical Specification clarifications. They also accepted and developed numerous poorly supported or poorly documented operability determinations. Overall, operator training performance remained satisfactory. Corrective action effectiveness continued to be a problem area during this period.

Professionalism in the control room remained strong, and operator performance during routine and noncomplex events was generally good. This was demonstrated during the plant trip caused by a partial loss of feedwater. However, throughout the SALP period, operators continually committed minor errors involving procedure implementation, log taking, and equipment configuration control. Individually, these instances were of little safety significance, but together they indicated continuing lapses in attentiveness and concern for detail.

Although the operators placed and maintained the plant in a safe, stable shutdown condition following the frazil ice event, there were several operator performance problems and procedure deficiencies which complicated the overall response. As in the case of the

drain-down event of the previous assessment period, some of these problems indicated weaknesses in operator system knowledge and deficiencies in procedure compliance and command and control practices during complex events.

Operators continued to demonstrate a high degree of ownership of control room material condition deficiencies. The number of inoperable main control board annunciators was maintained at a low level throughout the assessment period.

Training of the operations staff was satisfactory; however, some operator performance problems during the frazil ice event were attributed to apparent training weaknesses. The licensee's operator requalification program was effectively implemented. Complex simulator scenarios and the performance of the instructors during simulated emergency preparedness exercises were especially effective training initiatives.

The licensee typically demonstrated an appropriate level of management oversight and a good safety focus. Shift supervisors usually demonstrated a questioning attitude and conservative decision making. Operations management, however, failed to take effective corrective actions for, and allowed to remain in place, a number of inappropriate Technical Specification clarifications which conflicted with the operating license. In addition, operators initiated and accepted a number of poorly supported and poorly documented operability determinations.

The operations department completed a number of self-assessments, and the corrective actions for past problems (e.g., clearance orders) were effective; however, ineffective corrective actions were identified in other areas throughout the assessment period. Additionally, there were several examples of weak root cause evaluations. Recently, the licensee's review of corrective actions related to significant Problem Identification Requests has improved; however, sustained improvement was not demonstrated by the end of the assessment period.

The performance rating in the operations functional area was determined to be Category 2.

III. MAINTENANCE

Overall safety performance in the Maintenance area was good. However, the recurrence of previously identified problems detracted from overall effectiveness. The material condition of the plant was very good; however, problems with the auxiliary feedwater system were evident throughout the assessment period. Craft personnel demonstrated good individual skills, but there were several instances of nonadherence to procedures. This was compounded by the identification of numerous minor deficiencies in surveillance procedures and a lack of clarity in work instructions. Planning and scheduling effectiveness improved significantly, but the risk associated with emergent work was not always properly considered. Audits and self assessments of maintenance activities were appropriate, but the implementation of effective corrective actions was inconsistent.

The overall material condition of plant systems, structures, and components was very good. One plant transient, a reactor scram which resulted from a failure of a feedwater valve stem, was initiated by a material condition failure. Altogether, this was evidence of an effective preventive maintenance program and the proper implementation of high risk surveillances. In contrast, continuing problems were experienced with the auxiliary feedwater system. This was most evident when, during the frazil ice event, the turbine driven auxiliary feedwater pump packing failed and the pump had to be declared inoperable.

The skills of the various craft personnel remained an area of strength. However, as was noted in the previous SALP report, there were numerous instances in which individuals failed to adhere to procedural guidance. This resulted in examples of work being performed beyond the scope allowed and in maintenance activities being improperly conducted. Additionally, there were several examples of inadequacies in surveillance procedures, which resulted in some tests being missed and others being improperly conducted.

During this assessment period, the planning and scheduling of work activities improved significantly. This was evidenced by the increased effectiveness of the weekly work schedule and the reduction in the overall work backlog. Risk was integrated into both the planning and implementation of maintenance tasks. Human-factors enhancements were instituted to increase the awareness of the staff to know which was the "protected train." However, while the process for considering the effects of risk on emergent work activities was in place, its effectiveness was limited and the "protected train" concept was not always maintained.

Quality surveillances and audits and organizational self-assessments were inconsistent in effecting change within the maintenance functional area. While the licensee continued to be effective in identifying problems, there were several occasions where effective corrective actions were neither developed nor implemented. This was exemplified by the repetitive instances of procedural nonadherence and the long-standing difficulties associated with the auxiliary feedwater system.

The performance rating in the maintenance functional area was determined to be Category 2.

IV. ENGINEERING

Performance in the engineering area declined during this assessment period. The support to both the operations and maintenance functions was inconsistent. Problems were identified with the accessibility of design basis information. Consistently comprehensive 10 CFR 50.59 evaluations were not conducted. Additionally, there were numerous examples where corrective actions developed in response to identified problems were not thorough and, therefore, did not completely resolve the associated issues. Management implemented initiatives to address the performance decline, but results had not been observed prior to the end of the SALP period.

Support to operations often lacked rigor and comprehensiveness. Operability evaluations during the frazil ice event did not provide rigorous technical bases to support operability determinations. In addition, engineering had numerous opportunities prior to the event to identify and correct the inherent design errors with the essential service water system warming lines. Weak operability determinations continued throughout the assessment period; however, improvement was noted during the last 6 months.

Support to maintenance was also inconsistent and contributed to instances of equipment inoperability and unavailability. The engineering support provided to resolving the auxiliary feedwater pump problems was especially poor and resulted in questions concerning the acceptability of the pumps' packing, bearings, and lubricating oil system. Incompleteness in the engineering support associated with the feedwater regulating valves resulted in improper material procurement and a subsequent valve failure. This failure resulted in an unplanned reactor trip.

During the assessment period, it was discovered that design basis notebooks were no longer being controlled or maintained up-to-date. In addition, design information was not being maintained in any central location. While design and vendor information was available, there was difficulty in retrieving this information in a timely manner, and this difficulty was a contributing factor to the problems identified in supporting the operations and maintenance functions.

Weaknesses were also noted in the implementation of the 10 CFR 50.59 process. For example, when the inspection frequency of the reactor coolant pump flywheel was changed, the 50.59 review did not identify the requirements for the inspection. This led to a violation of the Technical Specifications. In addition, Technical Specification clarifications were found in use which had been reviewed using a 50.59 type of process. The guidance in several of these clarifications was in direct conflict with the Technical Specifications, and some had actually been implemented. Engineering participated in their development and approved them as a member of the Plant Safety Review Committee.

The most significant shortcoming in the engineering area was the organization's failure to resolve identified problems. Throughout the assessment period, problems occurred or recurred that should have been precluded as part of the corrective action process for previously identified problems. Engineering's failure to properly identify the vulnerabilities of the essential service water system warming lines was one example. The failure to ensure the procurement of proper roll pins for the feedwater regulating valves was another. A third example was the failure of engineering to properly identify the noncompliance of the Technical Specification clarifications, even after they had been questioned by a quality audit.

During the latter stages of the assessment period, performance deficiencies were recognized and initiatives were put in place to improve performance. A program to assure accountability for quality of engineering work products was implemented. A Corrective Action Review Board was chartered to assure that root causes were correctly identified and that corrective actions were broadly applied. Specific training was scheduled to

upgrade the quality of root cause analyses. The long-term results of these initiatives has not yet been demonstrated and, therefore, it is too early to draw any conclusion as to their effectiveness.

The performance rating in the engineering functional area was determined to be Category 3.

V. PLANT SUPPORT

Overall safety performance in the plant support area was good, having declined from its previous superior level. Radiological controls' performance declined slightly as a result of repetitive performance problems. In the emergency preparedness area, although biennial exercise weaknesses identified during the previous assessment were corrected, multiple problems, some of them repetitive, continued to be identified. Performance in the security area was maintained at a high level. Housekeeping remained excellent overall.

In the area of radiological controls, overall performance was good. Excellent performance was noted in the areas of radiological environmental monitoring, solid radioactive waste management, and transportation of radioactive materials. A generally good radioactive effluent program was implemented by the chemistry organization. The control of radioactive materials, surveys, and personal monitoring was good. The reduction of the 3-year person-rem average indicated an effective as-low-as-is-reasonably-achievable program, which was strongly supported by management. There was a significant reduction in personnel exposure during the 1996 refueling outage. However, multiple implementation problems involving postings and barriers of high radiation areas, radiological work practices, contamination controls, and control of radiography indicated a decline in radiological protection technician and radiation worker performance. The repetitiveness of these errors also indicated less than fully effective corrective actions.

Performance in the emergency preparedness area was generally good, but there were a number of implementation problems. Emergency response facilities were properly maintained, and the functionality of the backup emergency response facilities was improved. Emergency preparedness training was satisfactorily implemented, and emergency plan implementation during the simulator walk-throughs was generally good. However, corrective action weaknesses were identified in a number of areas. Failures to effectively communicate and assess available information resulted in delays in emergency action level determinations during the 1996 frazil ice event and during the 1997 biennial exercise. Ineffective corrective action implementation stemming from the frazil ice event resulted in an inadvertent reduction in emergency planning effectiveness and contributed to an exercise weakness during the simulator walk-throughs.

The security program continued to perform at a high level, with strong senior management support being evident. The security training program, assessment aids, records and reports program, access authorization program, and land vehicle barrier system were assessed as excellent. An effective compensatory measures program was implemented

and, as a result of effective maintenance support, compensatory postings for identified problems were minimized. A good program for searching personnel, packages, and vehicles was implemented.

General plant housekeeping was excellent overall. Radiological housekeeping was assessed as good.

The effectiveness of self-assessments and corrective actions was mixed. The self-assessments of the radiological controls programs were good; however, corrective actions were neither timely nor effective in preventing the recurrence of all performance deficiencies. Late in the assessment period, a comprehensive plan to review and improve the radiological protection program was initiated. The scope of the security audit did not include three program areas, and corrective actions in the emergency preparedness area were not fully effective in correcting communication weaknesses that were evident during this and the previous assessment period.

The performance rating in the plant support functional area was determined to be Category 2.