ENCLOSURE 1

SYSTEMATIC ASSESSMENT OF LICENSEE PERFORMANCE
HOPE CREEK GENERATING STATION

REPORT NO. 50-354/96-99

I. BACKGROUND

The Systematic Assessment of Licensee Performance (SALP) Board convened on November 21, 1996, to assess the nuclear safety performance of Hope Creek Generating Station for the period of April 23, 1995, through November 9, 1996. The board was convened pursuant to U.S. Nuclear Regulatory Commission (NRC) Management Directive (MD) 8.5, "Systematic Assessment of Licensee Performance (SALP)" (see NRC Administrative Letter 93-02). The board members included Richard W. Cooper, (Board Chairman), Director, Division of Reactor Projects, NRC Region I (RI); James T. Wiggins, Director, Division of Reactor Safety, NRC RI; and John F. Stolz, Director, Project Directorate 1-2, NRC Office of Nuclear Reactor Regulation. The board developed this assessment for approval by the Region I Administrator.

The performance category ratings and the assessment functional areas used below are defined and described in NRC MD 8.6.

II. PERFORMANCE ANALYSIS - OPERATIONS

Operations performance was weak early in this SALP period, but licensee corrective actions resulted in improved performance by the end of the period. A significant event involving a loss of shutdown cooling early in the period indicated a continuation of the declining performance noted in the last SALP period. That event revealed numerous weaknesses including poor internal communications within the operating shifts; problems with procedural adherence by operators; failure of plant management to initially understand and assess the significance of the event; and ineffective corrective actions to multiple, previous interruptions of shutdown cooling. An operations department intervention was implemented that included a change in operations management and the removal of several operators whose performance had not met management expectations. Senior plant management also revised the planned fall 1995 refueling outage scope to improve the material condition of the plant in order to minimize challenges to the operators. During the refueling outage from November 1995 through March 1996, operations performance began to improve as higher performance standards were starting to take effect. Overall plant performance following the refueling outage was improved as evidenced by fewer equipment and personnel problems. In addition, operators were observed to have taken a clear leadership role in plant operation by establishing priorities and standards for the organization.

Management effectiveness in operations was mixed but improving as the period ended. In addition to the operations department personnel changes described above, improved operations department work standards were developed by the senior shift supervisors. These work standards provided clear management expectations to all personnel performing operational duties. Management presence, both line and independent observers from

Salem Station senior management, was increased in the control room, especially for critical evolutions involving the shutdown and startup of the plant for Refueling Outage No. 6 and for specific high risk activities, like those that could have caused a loss of shutdown cooling.

Work control and configuration control problems revealed organizational interface weaknesses between Operations and Maintenance; and Operations and Engineering. Strong work coordination was not evident during the initial implementation of the work week schedule process, as evidenced by the "B" emergency diesel generator outage in the summer of 1996. Similar problems subsequently occurred during an on-line system outage for the core spray system, indicating that the corrective actions from the previous event were not fully effective. Additionally, the operations organization performed some poor 10CFR 50.59 screening evaluations in support of system operating procedure or system alignment changes for the service water and safety auxiliary cooling water (SACS) systems. The changes were not always completed with sufficient engineering input to ensure that the design bases were maintained. This showed a lack of sensitivity by operations to the engineering concerns regarding the station's ultimate heat sink.

Operator knowledge of plant systems and components was, in general, sufficient; however, on occasion, operators failed to appropriately interpret Technical Specification (TS) requirements and lacked specific operational knowledge of some systems. For example, operators did not always enter the appropriate limiting condition for operation and perform required associated actions, including surveillance activities or other conditional requirements, upon discovery of degraded equipment. Further, insufficient knowledge was exhibited during operation of the traversing in-core probe system in the manual mode.

Operation's performance in identifying and correcting problems improved over the period. At the beginning of the period tagging deficiencies had been identified as a contributing factor to several minor events, however, later in the period management initiated corrective actions and the number of tagging errors began to decline. The Operations Department procedure revision backlog remained high. Furthermore, there were numerous examples of poor quality procedures contributing to plant events during this SALP period. Corrective actions resulted in improved operability determinations near the end of the period.

In summary, operator performance improved over the period. However, operators on several occasions failed to identify and take actions to ensure that TS requirements were met. Further, the Operation's organization interface with Maintenance and Engineering was at times weak. Performance in identifying and correcting problems was mixed. Recent positive initiatives to reduce tagging deficiencies and improve operability determinations have resulted in some performance improvements in these areas. However, the procedure revision backlog remains high and is continuing to provide challenges to the plant operators.

The licensee's performance in the operations functional area is rated Category 2.

III. PERFORMANCE ANALYSIS - MAINTENANCE

Maintenance department staffing and management remained relatively stable in comparison to other parts of the organization, while many significant changes related to work control processes and the performance of work and testing occurred. Examples included: the technical specification surveillance improvement process (TSSIP); the shift to a new work week management program; continued improvement in the use of the corrective actions program; and, the implementation of a Work-it-Now team. In general, those changes contributed to improved maintenance performance throughout the period. However, there were large backlogs noted in procedure revisions, and preventive and corrective maintenance activities, as well as some recurrent equipment performance problems that indicated additional improvement is warranted.

While no maintenance activities resulted in significant plant transients, some maintenance related events occurred early in the period. Performance problems included failures to perform post-maintenance control rod scram time testing and appropriate control rod withdrawal speed adjustments; repeat failures to adhere to procedures by technicians during service water system strainer repairs; and, a failure to properly trend root cause failure data for the Bailey controls, which is a requirement of the license. The conduct of maintenance and surveillance improved as the licensee staff became more familiar with the use of the new work week schedule. Also, notwithstanding the surveillance test procedure inadequacies noted during the period, the technical specification surveillance test program results generally demonstrated the readiness of safety-related equipment to perform its safety functions.

The material condition of the plant improved over the SALP period. This resulted from the significant extension of Refueling Outage No. 6 to fix plant deficiencies that had resulted in frequent challenges to the operators prior to the outage, and implementing a high-volume, low-threshold deficiency reporting system that resulted in a significant increase in the overall number of identified plant deficiencies. Accordingly, the preventive and corrective maintenance backlogs and the backlog of maintenance procedure revisions remained high throughout the SALP period.

The corrective action program was significantly revised in July 1995 to enhance problem identification, corrective action tracking, and performance monitoring. However, implementation of this program was not effective in correcting chronic system or component failures. For example, the SACS Hiller-actuated valves continued to exhibit problems throughout the SALP period. Other long-standing equipment problems included degraded effluent radiation monitors, reactor manual control system controls, control room emergency filtration system controls, and ultimate heat sink components like the service water pump discharge isolation valves, pump discharge strainer elements, and the SACS system to turbine cooling system isolation valves.

In summary, maintenance and surveillance programs showed improvement during the SALP period. The TSSIP program was considered a positive effort by improving weak technical specification surveillance procedures. The surveillance program generally demonstrated the readiness of safety-related equipment. The maintenance program was generally good; however, some significant performance problems were noted. The maintenance backlogs

remained high. Some long-standing equipment deficiencies have not been effectively resolved. The new work week management program was considered a positive effort to improve the scheduling of activities to ensure redundant equipment remained available during significant on-line, system maintenance outages.

The licensee's performance in the maintenance functional area is rated Category 2.

III. PERFORMANCE ANALYSIS - ENGINEERING

Site management continued to provide good oversight for engineering activities. Further improvement in management's assessment of engineering issues was noted throughout the period. For instance, engineering activities strongly focused on comprehensively addressing design basis issues associated with the service water system and the SACS. The licensee managed the engineering backlog well. Oversight activities contributed to improving performance in engineering by finding noteworthy operability problems in the operating configuration for the SACS system and in a procedure that governed the refill of a drained service water loop.

Performance of engineering activities as they support operation of the plant was inconsistent. In general, the site staff was effective in identifying and documenting engineering deficiencies. Root cause analyses were generally good. However, the quality of corrective actions varied. Engineering activities resulted in a thorough understanding of available design margins in the SACS and service water systems. However, as also described in our assessment of the operations functional area, there were instances where information about the available design margin was not effectively communicated to operations personnel who made initial inappropriate safety and operability determinations associated with system configuration changes. Also, the licensee initially reacted slowly to a potential fire-protection system - emergency diesel generator interaction problem. The quality of the response to chronic system or component failures also varied. For example, activities in reaction to problems with Hiller actuators, while generally well-focused, did not uncover the apparent root cause of those failures for an extended period of time until inputs from both the actuator and the valve vendors were sought and considered. Similarly, the response to problems with the installation of reactor building ventilation backdraft dampers was initially slow and not comprehensive.

The quality of engineering activities associated with plant modifications was generally good. Temporary modifications were well managed. The licensee performed high quality technical analyses and calculations to support permanent changes. However, in the case of a service water system change, while the technical bases for the change were supported well, the licensee did not appropriately address the results of the safety evaluation that indicated that the change would render a technical specification performance parameter incorrect or nonconservative.

Engineering activities provided excellent support of significant testing programs. The TSSIP program effectively identified discrepancies between technical specification surveillance requirements and field-implemented testing procedures. Further, engineering activities supported well the Generic Letter 89-10 motor operated valve (MOV) program,

the erosion/corrosion program, the inservice testing (IST) and inspection (ISI) programs and the 10CFR 50 Appendix J, containment penetration leak-rate program. In reaction to design bases issues associated with systems such as service water and SACS that were identified through engineering activities, the licensee identified the need to conduct a design basis documentation review.

Site engineering staff were knowledgeable and demonstrated overall good performance. The results of a self-assessment of engineering staff training indicated that training was effective in improving performance.

In summary, performance in the engineering area remained good. The engineering staff were generally knowledgeable, and engineering training contributed positively to performance. Noteworthy improvements involved activities focused on understanding SACS and service water system design margins and on support to testing activities. Engineering activities contributed well to the identification, evaluation and root cause assessment of problems, but the quality of corrective actions was mixed. Some longstanding, chronic component problems were resolved or solution strategies developed this period; however, earlier actions on these issues could have been more comprehensive and timely. Strong support was provided for programmatic testing activities such as MOV, IST, ISI, erosion/corrosion, TSSIP and containment leak-rate testing. However, weak communications with Operations resulted in some 10CFR 50.59 evaluations that were not appropriate because they reflected an incomplete understanding of design margins associated with the system configuration changes.

The licensee's performance in the engineering functional area is rated Category 2.

V. PERFORMANCE ANALYSIS - PLANT SUPPORT

Performance in the Plant Support area was mixed, with a significant decline noted in the area of security. The radiation protection organization provided for very good oversight of radiological activities and training of personnel. The respiratory protection and radwaste transportation programs were of very good quality. The initial corrective measures and diagnostic approaches for several radiological control area entry issues and a recent elevated radioactive gas release were not timely.

ALARA program performance showed some weaknesses. For example, poor coordination between the ALARA group and other station departments, such as maintenance planners, prevented the implementation of comprehensive ALARA measures. The internal exposure measurement program was weak in assessing personnel exposure attributable to intakes of non-gamma emitters. Environmental monitoring and effluent controls programs generally met regulatory requirements; however, chronic process monitoring equipment problems, such as those experienced with the offgas pretreatment monitors, challenged station personnel. Although there was generally good performance observed during the May, 1996 Hope Creek annual emergency preparedness exercise, some problems were noted. For example, during a May, 1996 unannounced call-out drill, many participants did not appropriately respond. In addition, some were not familiar with their responsibilities and the Emergency Response Manager did not exhibit appropriate command and control.

Late in the assessment period, performance of the licensee's security program demonstrated a significant downward trend, particularly in the area of access controls. Significant problems were noted in security officer performance, communications with operations, use of the problem reporting system, and in licensee oversight of the security contractor. The failure of station management and the licensee's independent oversight groups to identify and promptly address those significant security program degradations raised concerns relative to their effectiveness.

The fire protection and prevention program was effectively implemented. Fire-fighting equipment maintenance and surveillance were good. A modification of the fire protection monitoring and alarm system upgraded equipment that had previously been noted as needing frequent repair. Drills demonstrated the licensee's readiness and fire fighting capabilities. Controls of combustible materials and ignition sources continued to be a strength. Generally, housekeeping was excellent.

In summary, in the Plant Support area, the radiation protection staff implemented an effective interface with the work force in providing excellent job coverage, however, the exposure reduction was hampered by insufficient ALARA planning and coordination among the affected station organizations. The radwaste transportation program was generally of very good quality. Poor process monitoring equipment reliability challenged the effluent controls program throughout the assessment period. Emergency exercise performance was good, however some program and procedure deficiencies were noted. The security program demonstrated significant access control deficiencies late in the assessment period, raising concerns about security guard force performance and the effectiveness of oversight of the program by both station management and independent oversight groups. The fire protection program was effectively implemented, and housekeeping was generally excellent.

The Plant Support area was rated Category 2.