PALISADES SALP 14

Report No. 50-255/96001

I. INTRODUCTION

The Systematic Assessment of Licensee Performance (SALP) process is used to develop the Nuclear Regulatory Commission's (NRCs) conclusions regarding a licensee's safety performance. Four functional areas are assessed: Operations, Maintenance, Engineering, and Plant Support. The SALP report documents the NRC's observations and insights on a licensee's performance and communicates the results to the licensee and the public. It provides a vehicle for clear communication with licensee management that focuses on plant performance relative to safety risk perspectives. The NRC utilizes SALP results when allocating NRC inspection resources at licensee facilities.

This report is the NRC's assessment of the safety performance at the Palisades Nuclear Generating Station for the period from May 28, 1995 through November 23, 1996.

Board Chairperson

G. E. Grant, Director, Division of Reactor Safety

Board Members

J. L. Caldwell, Director, Division of Reactor Projects
J. N. Hannon, Director, Project Directorate III-1, NRR

II. PERFORMANCE ANALYSIS

Operations

Performance in operations was good and showed some improvement from the previous period. Several licensee initiatives to improve operations performance were evident. Progress was made in the areas of supervisory oversight, reactivity management, and communications. However, several operator errors occurred during the middle of the SALP period. Consequently, the rate of improvement noted in the previous SALP period was not sustained. However, overall plant operations were conducted in a safe and conservative manner.

Good performance continued to be demonstrated in that no significant plant transients occurred due to operator error. Licensee initiatives to improve operator performance included stationing a third senior reactor operator in the control room, to directly monitor and supervise activities at the reactor controls. The control room was physically modified to significantly expand the previously cramped floor space and initiatives were taken to reduce the control room noise level. A three way communication standard was implemented and reinforced to improve the reliability of communications. Controls on boration and dilution were tightened to more closely control reactivity. Late in the period, a two day work stand down was taken to address a series of operations and maintenance errors and to refocus personnel on attention to detail.

Operator performance in response to transients and plant anomalies was very good. These included a rapid partial power reduction when a cooling tower pump tripped, manual control of the main turbine after two unplanned partial closures of turbine governor valves, and properly tripping the reactor in response to a leak on a primary coolant system flow transmitter. Operators also diagnosed several plant anomalies well. These anomalies included an inoperable control rod, a misaligned primary makeup water valve, and broken connections between the main generator and isophase bus. However, the overall good performance was lessened by recurring operator errors due to instances of insufficient formality, lack of questioning attitude, and poor individual operator performance. The most significant of these operator errors occurred in the middle of the period, when an operator withdrew control rods to maintain primary coolant system temperature, while the reactor was below the point of adding heat. Alert oversight by offshift management resulted in the startup rate limit being only slightly exceeded.

Also in the middle of the period, operators inadvertently and prematurely disabled the safety injection system low pressurizer pressure function during a plant shutdown. This error followed a series of other, less significant errors, and, in response, the licensee took aggressive action to improve operations performance by enhancing operator communications and supervision. However, near the end of the SALP period, several additional errors occurred which suggested that these corrective actions were not completely effective. Two brief lapses in control room senior reactor operator manning occurred, and testing was missed on low pressure safety injection pump motor breakers. More significantly, an important power source for the shutdown cooling system was inadvertently removed while shutdown cooling was required to remove decay heat from the shutdown reactor; independent controls prevented an actual loss of shutdown cooling. Separately, the reactor was inadvertently tripped while it was partially disassembled due to incomplete verification of the status of the reactor vessel disassembly.

Some examples of weak training evaluations of operator performance were also seen. The most significant example concerned a deficient evaluation of a shift supervisor's knowledge of emergency operating procedures.

Similar weaknesses were noted in the previous SALP. The licensee's corrective actions and self assessments have not consistently remedied these weaknesses. While the licensee's immediate, short term corrective actions were effective for brief periods, operator errors caused by inattention, misunderstanding, or incomplete communications persisted.

The performance rating in Operations is Category 2.

Maintenance

Performance in the maintenance area was good. The staff demonstrated good teamwork and communication. The use of the 13 week planning schedule and the Fix-It Now (FIN) team resulted in effective management of the maintenance workload. Assessment and resolutions for problems encountered during maintenance tasks were thorough and resulted in effective corrective actions. However, work package deficiencies led to unsuccessful

completion of some maintenance tasks, and identification and resolution of material condition deficiencies was inconsistent.

The overall quality of maintenance and surveillance activities was good. The maintenance staff demonstrated good teamwork and communication. Work groups communicated effectively during major equipment maintenance outages and good inter-departmental teamwork was noted, particularly during troubleshooting and resolution of equipment problems. Troubleshooting and repair of the high pressure safety injection pump breaker overcurrent relay had good interdepartment communications and a good root cause investigation.

Use of the 13 week maintenance planning schedule and implementation of the FIN team resulted in a reduction in the backlog of corrective maintenance work orders. Equipment outage planning improved during the assessment period, as evidenced by the decrease in the number of work orders following completion of system outages. However, insufficient contingency resources were allocated in the 13 week schedule to address emergent work. As a result, emergent work often had a significant adverse impact on completion of scheduled maintenance activities. The FIN team was effective in addressing many of these emergent issues, resulting in improvement in meeting the 13 week schedule.

Deficiencies in work packages resulted in ineffective completion of some maintenance tasks. Problems with work planning included lack of sufficient contingency planning, inadequate tagouts, and failure to provide parts required to complete activities. Several of these problems were identified in the boric acid transfer pump and emergency diesel generator maintenance outages.

Identification and resolution of material condition deficiencies was inconsistent. A number of previously unidentified material condition problems caused minor transients which challenged plant operations. Some identified problems were effectively addressed, such as those for the emergency diesel generators and the charging pumps; however, other known deficiencies lacked a corrective action plan. In particular, known deficiencies with feedwater heaters control valve air lines, chemical waste drain piping, and leaking system isolation valves, which had not been scheduled for repair, resulted in challenges to plant operation or personnel safety. The licensee initiated repairs near the end of the assessment period to address several longstanding material condition deficiencies, such as the auxiliary feedwater turbine spin and atmospheric dump valve leakage issues.

Self assessments of problems encountered during maintenance activities were thorough and effective. Lessons learned were communicated to the maintenance staff during routine stand down meetings and were effectively incorporated in subsequent tasks.

The performance rating in Maintenance is Category 2.

Engineering

Progress continued on many engineering initiatives from the previous assessment period, including reduction in the backlog of engineering tasks, improvements in plant material condition, enhanced engineering performance, and completion of various programs (Appendix R re-analysis, GL 89-10 and Alloy 600 inspections). Among the backlog items completed were issuance or revision of many engineering procedures, completion of

multiple drawing changes, and a reduction in open engineering work orders. Plant material condition was improved through the completion of major projects from the 1995 outage such as the containment air cooler replacements, overhaul of an emergency diesel, and service water system upgrades. These improvements were accomplished with few engineering problems. However, as noted below, lapses continued to occur in the thoroughness of root cause evaluations, and the follow-through and effectiveness of corrective actions.

Engineering support to the plant generally improved and contributed to improved plant material condition. System health reports and system engineer presence at significant surveillances were positive contributors to tracking equipment performance and needed maintenance. While field work was not yet completed, activities were in progress to address longstanding issues involving the diesel fuel oil storage tank replacement, control room ventilation silencing, and the rotating auxiliary feedwater turbine repair. Engineering was active in addressing operations department issues. The operator concerns list was given the appropriate priority and many of the issues were successfully resolved. The engineering qualification program was formalized and managers ensured the engineering staff met the qualification criteria.

However, some engineering activities lacked effective oversight. No progress had been made in reviewing and updating the design basis documents since the last SALP period. Several temporary modifications did not conform to the administrative requirements of the temporary modification procedure. Corrective actions from the Appendix R re-analysis, which revised a procedure and made a setpoint change, did not have appropriate engineering reviews.

Several plant equipment issues indicated that some problems were not aggressively identified and resolved. For example, component cooling water system (CCW) expansion joints, which had a limited service life, did not have preventative maintenance. NRC involvement was necessary to ensure the review for adequate preventative maintenance was expanded to expansion joints in other systems. Other limited life components, such as leather and rubber parts in the emergency diesel generator governor servomotor, were not in the maintenance program and failed during testing. A 2400 volt cable failed during operation after numerous spurious ground indications during the previous outage. The plant also experienced transients from unexpected feedwater system air service failures.

The scope of corrective actions was sometimes too narrow and some corrective actions were not timely. For example, short term corrective actions for many of the deficiencies identified during the Appendix R re-analysis, such as reliance on fire watches as the only remedy, were too limited for the potential fire risks. Restoration efforts on the refueling transfer cart, while eventually thorough, were not timely. The scope of planned repairs on the transfer cart, which had been neglected for a long time, was too narrow. As a result, additional necessary repairs to the transfer cart were identified. However, because of the pending outage, insufficient lead time was available to develop appropriate planning and decontamination alternatives. Although the need for a maintenance program for molded case circuit breakers was identified in 1993, no such maintenance program was developed. Several molded case D.C. circuit breakers subsequently failed trip setpoint testing during this SALP period. The evaluation of a General Electric Service Information

Letter (SIL) for "Topaz" inverters was too narrow in that it concluded the SIL was not applicable to Palisades' inverter because of different vendors. Subsequently, however, the low voltage setpoint for Palisades' inverter was determined to be susceptible to the described condition.

The performance rating in Engineering is Category 2.

Plant Support

Overall performance in the area of plant support was good; however, some weaknesses occurred in all areas. Radiation protection performance was good. Dose control during outages and with emergent work activities was adequate. During this assessment period, two refueling outages were conducted. The exposure total for the 1995 refueling outage exceeded the established goal. This was partially due to increases in work scope and inaccurate dose projections. Preliminary performance for the 1996 refueling outage was better than originally planned; however, only limited work had been completed by the end of the assessment period. The poor material condition of the fuel handling system led to the need for extensive repairs, which resulted in substantial dose being expended. This poor material condition, along with poor scheduling of the work activity just prior to the refueling outage, limited the options available to the radiation safety group to better control exposures. Other items noted during this assessment period included the discovery of a non-conservative alarm setpoint for the control room continuous air monitor. Also, the respiratory protection decision making process for the transuranic hazards (alpha radiation) at the facility was weak.

Chemistry and Radiological Environmental Monitoring Program (REMP) performance was very good. Plant water chemistry was maintained well within guidelines and excellent laboratory proficiency was displayed through confirmatory measurement results. Previously identified weaknesses in the REMP program were effectively corrected.

Security performance was good overall, and the security program was fundamentally sound. Management oversight resulted in program improvements, sufficient resources to effectively implement tactical response activities, and the protection of the sensitive information program. Consistent and frequent maintenance activities continued to ensure effective performance of security equipment. However, weak program implementation activities and procedural adherence incidents occurred. These weaknesses resulted in inconsistent implementation of the personnel search program, and partially degraded implementation of alarm station duties. A contributing factor to search program deficiencies was insufficient management oversight of personnel performance and less than effective corrective action for the deficiencies.

The effectiveness of the Emergency Preparedness (EP) program was good. Strengths included good operational status, excellent facility maintenance, an annual audit, and a relatively stable and experienced staff. Management support remained excellent. Improvement was noted in certain facility areas during recent inspections, especially the Technical Support Center. However, the Operations Support Center functions were weak,

and provisions for the NRC Site Team remained to be developed. Exercise performance early in the period was adequate, but improved later in the period. Performance during the subsequent 1996 exercise was good.

The performance rating in Plant Support is Category 2.