PRAIRIE ISLAND SALP 12

Report No. 50-282/306-96001

I. INTRODUCTION

The Systematic Assessment of Licensee Performance (SALP) process is used to develop the Nuclear Regulatory Commission's (NRC) conclusions regarding a licensee's safety performance. Four functional areas are assessed: Plant 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 uses SALP results when allocating NRC inspection resources at licensee facilities.

This report is the NRC's assessment of the safety performance at the Prairie Island Station for the period July 24, 1994, through February 17, 1996.

An NRC SALP Board, composed of the individuals listed below, met on February 28, 1996, and March 13, 1996, to assess performance in accordance with the guidance in NRC Management Directive 8.6, "Systematic Assessment of Licensee Performance."

Board Chairperson

J. L. Caldwell, Deputy Director, Division of Reactor Projects, RIII

Board Members

J. A. Grobe, Deputy Director, Division of Reactor Safety, RIII
J. N. Hannon, Director, Project Directorate III-1, NRR

II. PERFORMANCE ANALYSIS

A. Plant Operations

Performance in the plant operations area was excellent overall. Operations activities were characterized by strong management involvement, outstanding teamwork, strong safety focus and aggressive self-assessments. Operator performance was consistently effective and error free during routine and transient conditions. However, near the end of the assessment period, three operator errors involving infrequent operations occurred, indicating a potential problem with performance outside of routine activities.

Licensee management and operations staff and their committees aggressively pursued identification and evaluation of potential operability issues. A strong philosophy of safe operations was demonstrated by the decision to reduce power while investigating the cause of increased feedwater pump bearing temperatures. Operations aggressively identified problems and supported other departments in achieving effective resolution of problems. The weakness discussed in the previous SALP, involving lack of adequate guidance to implement the definition of operability relative to essential support

equipment, was effectively corrected. Self-assessments in the operations area were comprehensive and effective. Lessons learned from a reactor trip early during this SALP period were effective in preventing recurrence. Operations support of and continued communications with the maintenance and engineering departments was a major contribution to the excellent material condition of plant equipment.

Management established high standards and expectations for operating performance. As a result, operation was excellent during normal and transient conditions, where procedures and training were extensive. This was demonstrated by operator response to the loss of balance-of-plant annunciators and the slight primary-to-secondary steam generator tube leak. In both cases, the events were complex and required excellent analytical skills to understand and respond. There was good teamwork among the operating crews and other departments during the feedwater pump repair and restart efforts. Operators were also efficient in their response to a loss of one of the offsite power sources. Most of the time control room communications and formality were good.

However, there were recent examples of operator errors during infrequently performed activities that were uncharacteristic of performance during this period. The events included an operator misreading an equipment label and opening a live disconnect affecting power to a safeguards bus. This example had the potential of being a serious event because it occurred while at reduced reactor coolant inventory. In another case, an operator mispositioned a rod cluster control assembly (RCCA) change fixture, resulting in an RCCA being placed in the wrong location in the fixture. A third event involved a supervisor incorrectly communicating the refueling sequence plan, resulting in the wrong fuel assembly being removed from the reactor. Although management's response to the combination of the these events, including a work stoppage, was strong and effective in preventing recurrence during the remainder of the outage and subsequent plant startup, these errors indicated a potential problem with planning, preparation and expectations for activities infrequently performed.

Management was strongly involved in operator training. A continuous review and upgrade program was in place to address immediate and long range simulator repair and improvement initiatives. Efforts to revise the operator requalification program based on audits, industry and plant events, system and procedure modifications, and operator feedback were generally effective. A deficiency was identified in the program with the failure to conduct remedial training for an error in Emergency Operating Procedure usage.

The performance rating is Category 1 in this area.

B. Maintenance

The overall performance in the maintenance functional area was excellent. Active management support, effective work control, strong systems engineering support, and proficient craft personnel contributed to a facility that was well-maintained and had excellent material condition. Effective maintenance while online and during outages contributed to a high level of equipment

availability. Excellent outage planning and management were observed and attention was appropriately focused on minimizing shutdown risk. Interdepartmental teamwork, with emphasis on safety, improved during the period and was a strength. Teamwork was evident in, for example, engineering support of maintenance activities, work planning meetings, and day-to-day maintenance support to plant operations.

Management involvement in establishing a conservative safety focus was noted in the support of maintenance activities. Examples included the removal of Unit 1 from service to proactively replace a turbine trip solenoid valve, power reductions to perform feedwater pump work when early performance trends were observed, and the removal of steam generator tubes for analysis to resolve tube sleeve installation questions.

The preventive maintenance and equipment surveillance programs were well-implemented with a few minor exceptions. Inservice inspection and inservice testing programs were effectively implemented and the steam generator inspection and maintenance program was conservative. Improvements were made in the administrative controls of online maintenance, incorporating additional risk insights that had been identified. Quality of work was generally excellent and maintenance issues were promptly identified and resolved. Also, there was a very small backlog of corrective maintenance and the re-work rate was very low.

Plant repair work was performed effectively and was of high quality. However, a few maintenance-related events occurred during the period involving personnel error or procedural or work practice weaknesses. For example, problems occurred during maintenance on a Unit 2 pressurizer spray valve, safeguards traveling screens, containment hydrogen monitors, and an auxiliary building crane overload sensing device. Lessons were learned from these events to help improve performance.

Effective assessments of adequacy of maintenance activities were performed by the maintenance department line organization, the quality services organization, and the error reduction task force. Also, the cooling water system operational performance self-assessment provided findings of high value. For example, the self-assessment identified that improvements in post-maintenance testing specification, performance, and documentation were needed.

The performance rating is Category 1 in this area.

C. Engineering

Performance in the engineering area was good. Engineering activities were characterized by aggressive self-assessments, excellent support to other organizations, and outstanding material condition efforts. Management was decisively involved in all aspects of the engineering program. However, problems with safety evaluations surfaced throughout the evaluation period and oversight of the spent fuel storage installation, although improved at the end of the evaluation period, was initially weak.

The system engineering organization demonstrated continuing excellence in their questioning attitude, support to the maintenance process, and awareness of plant conditions. This was demonstrated by an engineer who aggressively pursued the root cause for the failure of the cooling water supply valve beyond the readily apparent valve limit switch arm adjustment problem. It was also demonstrated by the effective trending of feedwater pump vibrations, which resulted in early identification, and prompt repair, of gasket problems. Significant effort was expended in researching the design basis for the cooling water system before the performance of a detailed self-assessment and in resolving the technical deficiencies discovered, including testing deficiencies of the cooling water pumps.

An excellent, comprehensive self-assessment of the system engineering program was performed, and an aggressive implementation schedule was undertaken for resolving identified issues. Forceful control of temporary engineering modifications was exhibited, with only five temporary alterations open for both units at the end of the cycle. A concentrated effort was applied to address and resolve concerns identified during the last SALP assessment period, such as communications with the operations and maintenance departments. The concerns in the In-Service Testing program, identified during the last SALP cycle, were also corrected during this period.

The number of safety evaluations performed throughout the assessment period significantly increased from the last cycle and they were generally adequate to document that no unreviewed safety question existed. However, the requirements for when to perform safety evaluations were not always well understood. As a result, safety evaluations were not performed for bypassing an overload sensing device on the auxiliary building crane, a missed nondestructive examination required by the spent fuel storage installation safety analysis report, a design change to a dry cask, and a special test of the cooling water emergency intake line. Some weaknesses in engineering judgement were also apparent in the handling of water hammer calculations in the containment fan coolers.

Engineering involvement in the spent fuel storage installation was not aggressive. The complexity of the installation was not initially understood or appreciated by the licensee. As a result, NRC intervention was needed on some issues. Numerous vendor and fabricator deficiencies, illustrating weak involvement, occurred midway through the SALP cycle. These were largely corrected by the end of the cycle. Substantial improvements were ultimately made in the oversight of the cask vendor and fabricator, and later loadings of dry casks.

The performance rating is Category 2 in this area.

D. Plant Support

Performance in the plant support functional area was excellent. Strengths in the radiation protection, emergency preparedness, and security programs were

evidenced by continued low collective station personnel exposures, excellent operational status of the emergency preparedness program, and effective performance of the uniformed security force.

The radiological controls program continued to perform at an excellent level. Collective station personnel exposures continued to be among the lowest in the industry for pressurized water reactors. Contaminated areas within the plant were minimal and generation of radioactive waste was low. Excellent water chemistry was maintained for both primary and secondary systems. Good coordination was also noted between the chemistry and operations departments. The radiological environmental monitoring program continued to be effectively implemented.

The emergency preparedness (EP) program was excellent. Strengths included the excellent overall operational status of the program, the excellent state of operational readiness of response facilities, and continued management support. The annual audit of the EP program was of excellent scope and depth.

Performance in the security program contained some isolated weaknesses, but improved in the latter part of the assessment period. Management support for the security program was excellent. Past weaknesses with corrective actions to protect safeguards information, and with timely updates of plans and procedures, were effectively corrected. Performance of the security officers continued to be strong. Conversely, security shift supervisor performance declined in some respects and there were some procedure weaknesses at the corporate security office throughout most of the assessment period. Stability in supervisor staffing improved.

Performance of the site Quality Assurance organization was excellent in all plant support areas. Audits were thorough in nature and substantive findings were documented. Effective corrective actions were implemented by the responsible departments. Intradepartmental self-assessments were comprehensive and identified program weaknesses in need of improvements.

The performance rating is Category 1 in this area.