Dresden Generating Station – SALP 13
(Report Nos. 50-237;249/95001)

1.0 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. 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 Dresden Generating Station for the SALP 13 period from August 22, 1993, through March 18, 1995.

An NRC SALP Board, composed of the individuals listed below, met on March 29, 1995, to review the observations and data on performance and to assess performance in accordance with the guidance in NRC Management Directive 8.6, "Systematic Assessment of Licensee Performance."

Board Chairperson
C. D. Pederson, Director, Division of Radiation Safety and Safeguards, RIII

Board Members
J. L. Caldwell, Deputy Director, Division of Radiation Safety and Safeguards, RIII
R. A. Capra, Director, Project Directorate III-2, NRR
H. B. Clayton, Acting Deputy Director, Division of Reactor Projects, RIII

2.0 PERFORMANCE RATINGS

The current SALP process assesses performance in four functional areas. The four areas are Plant Operations, Maintenance, Engineering, and Plant Support. The Plant Support functional area assesses radiological controls, emergency preparedness, security, and chemistry. Three category ratings (1, 2, and 3) continue to be used in the assessment of performance in each functional area.

3.0 PERFORMANCE ANALYSIS

3.1 Plant Operations

Operations performance was adequate. Throughout the assessment period performance was cyclic as evidenced by procedural adherence problems, poor system configuration control, and inattention to critical plant parameters. The actions to improve station performance during the Fall of 1994 were good, but the momentum gained from those efforts was not sustained. Some improvement in management involvement and effectiveness was noted; however,

there were still examples where this was lacking. The rate of personnel errors by licensed operators remained high.

Safety focus was considered adequate. Early in the assessment period, operational control was weak during startups and specific evolutions such as starting safety related pumps. In addition, operator inattention resulted in a Unit 3 reactor trip in August 1994. The subsequent shutdown of both units during the Fall of 1994 was effective in the short term at improving personnel performance and resolving some equipment problems. In particular, the identification and resolution of numerous operator work-arounds and use of a formalized startup plan were positive. Late in the assessment period the effectiveness of improvement initiatives declined as evidenced by poor decision making such as the restart of the 2B recirculation pump in January 1995. Also late in the period, attention to the identification and resolution of work-arounds diminished.

Management's involvement, including communication and reinforcement of standards and expectations, was inconsistent. At the beginning of the period, weak management oversight resulted in a significant Unit 1 event and a failure to correct known emergency procedure deficiencies. During the Fall 1994 outages several initiatives were implemented to improve performance. These included an industry peer evaluation, the addition of two additional senior reactor operators to each shift, and emphasizing the self-check program. Initially, improvements were seen as demonstrated through error free startups in December 1994. However, in January 1995 a Unit 3 reactor trip and a recirculation pump start event indicated a decline in effective management involvement and followup.

Identification and resolution of issues was adequate and improving. Since the Fall 1994 outages, operators actively identified problems through the integrated reporting program. However, the evaluation and assessment of these problems did not identify some broader trends such as poor procedural adherence and inadequate corrective action on safety related instrumentation. The Management Review Board and Site Quality Verification (SQV) organization were more effective in identifying performance issues in the latter half of the period. A good overview of reactor operations was conducted by the Independent Safety Engineering Group following the Fall 1994 outages.

Procedure adherence was poor and some procedures were difficult to follow. Training of operators on procedure and technical specification changes was poor. In addition, licensed operator candidates were weak in system knowledge as demonstrated by a 60 percent (three out of five) failure rate during an initial license examination. Early in the assessment period, weaknesses were noted in the licensed operator requalification program. These weaknesses were corrected later in the assessment period. However, other weaknesses in procedure usage and three-way communications were identified as continuing problems.

The performance rating is Category 3 in this area.

3.2 Maintenance

Performance in the maintenance area was satisfactory. Some improvements in the overall material condition of the plant were made during the period. Specifically, substantial improvements were made during the Unit 3 outage similar to those made on Unit 2 in 1993. During the Fall 1994 shutdown, a number of operator work-arounds and other equipment problems were resolved. However, equipment failures continue to challenge reliable operation of the facility. A significant number of plant events resulted from improper maintenance activities and personnel errors. Continuing problems were noted with the work control process, personnel performance, and interdepartmental communications. Limited material condition improvements have been made, but the underlying problems with assessing and correcting plant material condition deficiencies have not been effectively addressed.

Safety focus was good. Positive initiatives included maintaining Units 2 and 3 in an extended outage to improve material condition and personnel performance. A major departmental reorganization enabled management to provide more focus on material condition and maintenance activities through a narrower scope of work responsibilities. Although recent management initiatives were generally successful, plant personnel were not sufficiently sensitive to foreign material exclusion control. In addition, the licensee had no formal method to minimize risk contribution from out-of-service activities.

Management's involvement in, and support of, maintenance activities was generally good. Initiatives such as empowerment of the instrument mechanics resulted in a reduced work backlog and the resolution of some long-standing hardware issues. Management's commitment to improve worker practices and adherence to radiation protection procedures was demonstrated by worker stand-downs. In addition, management's actions late in the assessment period to develop and improve worker standards were considered positive.

Some improvement in problem identification was noted; however, resolution of issues remained weak. Incomplete root cause evaluations, lack of trending, and incomplete corrective action implementation prevented the timely resolution of some long-standing problems such as the reactor water level switch calibration issue and foreign material exclusion control.

Programs and procedures for the conduct of maintenance and the control of work activities were ineffective. Due to some poorly planned maintenance activities, delays in repairing equipment occurred. In addition, weak documentation of past work activities reduced the quality of some work packages. These problems, coupled with weaknesses in the performance level and training of craft personnel, led to slow progress in reducing the corrective maintenance backlog and improving plant material condition.

On occasion, ineffective interdepartmental communications and teamwork resulted in performance problems. Maintenance personnel routinely manipulated equipment within an out-of-service boundary without operations knowledge or proper documentation. Communications between instrument mechanics and operators were informal resulting in unexpected alarms during surveillances.

Although some maintenance tasks were performed well, the quality of maintenance work during the period was frequently poor. Personnel errors, caused by inattention to detail and inadequate procedural adherence, resulted in several plant events, including inadvertent tripping of safety equipment and personnel working on the wrong unit or wrong train of equipment.

The performance rating is Category 2 in this area.

3.3 Engineering

While overall performance was adequate, continuing management oversight and emphasis is needed to improve the quality and effectiveness of the engineering process as well as to ensure the effective long-term resolution of technical issues. Weaknesses during this period were evident in system engineering, programs, procedure quality, and procedure adherence. This resulted in poor prioritization of work, reduced component reliability, and delays in identifying and resolving equipment problems. Consequently, improvement in overall plant material condition was limited. Later in the assessment period, measures were taken to correct these problems. Training was provided to system engineers in an effort to better define expectations and to improve performance. Toward the end of the assessment period, organizational changes were implemented to further improve engineering effectiveness.

Prior to the Fall 1994 unit outages, safety focus and management involvement in engineering were weak. The most significant deficiency was the failure to fully evaluate equipment or plant conditions for significance and potential safety impact. In addition, system engineers were not effective in identifying and resolving problems before equipment failures occurred. Poor prioritization of outstanding engineering work activities by management impeded improvement. During the Fall 1994 unit outages, consultants trained system engineers on how to identify and evaluate system deficiencies. At the same time, the engineering department was strengthened with the addition of industry experienced engineers. One result of these efforts was the identification of a number of operator work-arounds and other equipment deficiencies that were resolved during the Fall outage.

The quality of engineering work was adequate. Performance was good in the aggressive handling of pilot valve diaphragms and vent valve plugs. However, a lack of quality was evident in the resolution of issues in the instrument air system. In general, work quality suffered from poor engineering procedures, inadequate management reviews, large work backlog, and low expectations and standards. Increased management attention during the Fall outage and subsequent organizational changes resulted in elevating performance standards and improving consistency.

Throughout the period, performance in the area of programs and procedures was poor. Procedures governing the engineering program were outdated, inadequate, and incomplete. Numerous examples of missing references, unidentified transition points, and incorrect terminology existed. Additionally, the procedures that were in effect were not followed.

The performance rating is Category 3 in this area.

3.4 Plant Support

Overall plant support performance was satisfactory. Radiation protection performance declined over the first 12 months of the assessment period. In the latter part of the assessment period improvements were made in the rate of personnel contaminations, the amount of contaminated areas, and daily non-outage dose. The high collective exposure and continued contamination control problems at the end of the assessment period demonstrate the need for continued emphasis on improving performance in radiation practices. In emergency preparedness and security, a slight decline in performance was seen during this assessment period, but overall performance was good. Although significant procedural adherence and control problems existed in chemistry, plant water chemistry was good.

Radiation protection performance showed a slight improvement towards the end of the assessment period but remained poor. The total 1994 station dose of 838 person-rem was below the station's goal but was still among the highest in the industry. Although the daily non-outage dose decreased after improvement measures were initiated, it was still relatively high. Foreign material exclusion problems, spills of contaminated water, and a lack of focus on station and department dose goals contributed to the high station dose. With the exception of the Unit 3 chemical decontamination, little source term reduction was accomplished. Plant decontamination efforts late in the assessment period allowed unimpeded access to most safety related equipment and contributed to a significant decrease in the rate of personnel contamination events. Corrective actions for contaminated material control problems from the previous assessment period were not effective. A substantial number of contaminated items were identified outside the radiologically protected areas. Instances of poor radiation worker practices and failures to adhere to procedures exacerbated the station's high source term and contaminated material control problems. Corrective actions to reduce these problems have not been totally effective.

Performance in the chemistry and radiological environmental monitoring program areas was good. Plant water chemistry control continued to be good with an emphasis on reducing above-average feedwater iron levels. Although non-radiological confirmatory measurement results were excellent, the chemistry group was slow in revising and implementing changes to inadequate procedures. Surveillance of the post accident sampling system was not performed for about 1 year, owing to the lack of approved chemistry procedures. Additionally, corrective actions for failed in-line chemistry instruments were not performed. The implementation of the radiological environmental monitoring program was good, but material condition of the air sampling equipment was poor which increased the possibility of air bypassing the filter media.

The emergency preparedness performance was good. Effective corrective actions were implemented for the performance weaknesses that were identified in the 1993 exercise. Excellent initiatives were shown in conducting a peer review of the program and effective actions were taken to resolve identified deficiencies.

Security performance was good. Management and operational activities of the security organization were effective as demonstrated by improvements in tactical response capabilities, communication capabilities, coordination of plant work groups and the self-assessment program. Management overview, barrier integrity, and program implementation were good. However, there was a slight performance decline as evidenced by the weaknesses in package searches and some badge control problems.

The performance rating is Category 2 in this area.