COOPER NUCLEAR STATION
SYSTEMATIC ASSESSMENT OF LICENSEE PERFORMANCE (SALP)
Report 50-298/97-99

I BACKGROUND

The SALP Board convened on January 15, 1997, to assess the nuclear safety performance of the Cooper Nuclear Station for the period July 9, 1995, through January 11, 1997. The Board was conducted in accordance with Management Directive 8.6, "Systematic Assessment of Licensee Performance." The board members included: T. P. Gwynn (Board Chairperson), Director, Division of Reactor Safety, Region IV; D. D. Chamberlain, Acting Deputy Director, Division of Reactor Projects, Region IV; and E. G. Adensam, Deputy Director, Division of Reactor Projects - III/IV, Office of Nuclear Reactor Regulation. This assessment was reviewed and approved by the Regional Administrator.

Functional Areas and Ratings

	Current	Previous
Plant Operations	2	2
Maintenance	2	3
Engineering	3	3
Plant Support	2	2

II PLANT OPERATIONS

Overall safety performance in the plant operations area remained good. Some improvement was noted in Operations demonstrating leadership at the facility as well as in problem identification. Management involvement in operations was evident, but it was still not clear that management had been effective in establishing performance standards and monitoring methods necessary to achieve excellence in operations. Procedures and programs effectively supported sustained operation of the facility. Routine operations were assessed as strong, but concerns remained with operator response to off-normal or fast-moving events. Failures in operator requalification examinations reflected recurring performance deficiencies in crew command, control, communication, and procedure usage skills. Operations' problem identification had improved, but effective corrective actions and followup on the effectiveness of corrective actions were sometimes lacking, as evidenced by continuing problems with procedure adherence and requalification examination failures.

A high level of management involvement in day-to-day operations demonstrated commitment to strive for continued improvements in operations. Management's decision to shut down the unit in June 1996 to address concerns with fuel integrity demonstrated strong safety focus and a conservative operating philosophy. The July 1996 work standdown to address procedure adherence concerns in all functional areas was viewed as a positive effort, but the effectiveness was still to be demonstrated.

Standard operating procedures were generally good and supported long, continuous, trouble free runs of the unit. However, procedures and instructions for off-normal activities and emergent problems did not always provide appropriate or timely guidance, such as the procedure governing recovery from the January 1996 rod mispositioning event. Other

examples involved the untimely documentation of night order instructions. For instance, actions required by operators to mitigate ice buildup in circulating water bays were not documented in night orders until one week after the actions had been developed and logged. Other program and procedural concerns identified during the assessment period included the absence of procedures or plans to ensure the residual heat removal system remained available when performing core offloads to the fuel pool and the lack of procedure guidance to ensure that a nonconforming condition on one emergency diesel generator did not affect the alternate generator.

During day-to-day routine operations, few problems were noted in Operations' adherence to procedures; however, under stressful situations operators did not always adhere to procedures. A licensee Quality Assurance organization finding indicated that operators did not follow procedures during simulator training. During an emergency preparedness drill, both the licensee and NRC inspectors observed that operators did not properly implement procedures. Few opportunities were available to observe operations under stressful situations in the control room. However, requalification examination performance deficiencies and the January 1996 control rod mispositioning event indicated problems with command and control and supervisory oversight as well as procedure use. On the other hand, Operations' response to an actual fire in the protected area during an emergency exercise and the prompt reaction to ice buildup in the circulating water bays were appropriate.

Although several examples of a good questioning attitude were identified late in the assessment period, there were still instances noted where a stronger and more consistent questioning attitude was needed. For example, late in the period the control room identified insufficient work packages on several occasions and returned them to work control. However, during the same time frame, the control room initiated removal of a diesel generator from service at a time when its removal would have affected two safety system trains. A few months earlier, operators did not identify the need for an operability assessment for the installation of an unqualified relay and housing in vital station switchgear.

Concerns were identified with operations training. There were four crew failures during the requalification examinations during this assessment period. Operations needed to address the apparent lack of training effectiveness and improve its ability to detect declining crew and individual performance earlier.

The Plant Operations functional area was rated SALP Category 2.

III. MAINTENANCE

Overall safety performance in the Maintenance area improved during this assessment period and was determined to be good. The improved performance rating was principally attributed to efforts in improving the surveillance testing program, improvements in problem identification, and achieving an overall good material condition at the facility.

While overall performance improvement was noted in the Maintenance area, problems persisted in the implementation of the maintenance program. Maintenance management was not effective in establishing and achieving high expectations and performance standards for all groups within the maintenance organization. Procedure adherence remained a concern. Work control and scheduling continued to provide poor work instructions in some instances and continued to challenge operations with work packages that were not compatible with plant conditions. For example, work instructions for service water system valve repair were not clear and maintenance craft and supervision did not aggressively pursue the procedure ambiguities. Work packages submitted to the control room were sometimes unacceptable. For example, a work package had not properly identified the need to enter a Technical Specification action statement and a package including the use of test equipment on operable control rod drive circuitry did not include an evaluation of the configuration in accordance with the requirements of 10 CFR 50.59.

Despite the work control problems noted during this assessment period, the maintenance staff was effective in achieving an overall good material condition at the facility, and maintenance backlogs were effectively controlled. Improvements in control of minor maintenance and initiatives to finish work while equipment was out of service were viewed as key contributors to achieving good material condition at the facility. There were no significant plant challenges caused by equipment failures or maintenance activities.

Although implementation of the Maintenance Rule was ultimately found to be adequate, senior management emphasis on timely implementation and training was lacking. Last minute emphasis and poor preparation were viewed as key contributors to the problems identified by the NRC. There were numerous instances where training was lacking and where procedures did not provide sufficient staff guidance. Some functions were not included in the scope of the Maintenance Rule, the performance criteria for reliability were not properly developed and monitored, the unavailability of safety-related systems during shutdown conditions was not properly monitored, procedures to implement risk assessment when removing equipment from service were not adequately developed, and procedural requirements for initiating a risk-significant window checklist were not followed.

Few problems were noted in surveillance testing during this assessment period. Improvements were noted in problem identification with the Instrumentation and Control organization setting a high standard for problem identification that other groups on the site should be challenged to achieve.

Quality Assurance effectiveness in assessing performance in the Maintenance area was viewed as improved during this SALP period.

The Maintenance functional area was rated SALP Category 2.

IV ENGINEERING

Overall, performance in this functional area was considered to be acceptable, which represented the same performance level observed in the last assessment. Significant

performance problems continued to be identified in this area, although some improvement in discrete areas was noted. Of particular concern was the continuing inability to effectively resolve many long-standing weaknesses in the Engineering area, specifically in the area of system engineering performance. Concerns with procedure adherence were also identified during this assessment period. Continuing problems were noted in the areas of corrective actions, the understanding and application of design basis information, and the quality of engineering support. In contrast, the licensee's self-assessment and quality assurance performance improved significantly during this period.

Despite several initiatives, including the engineering transition plan and performance improvement plan, the licensee has not been successful in achieving substantial performance improvement. While some progress was noted in certain engineering programs, including the motor-operated valve program, the Design Criteria Document program, and the operating experience review program, the failure to adequately define responsibilities and standards resulted in limited effectiveness of many programs. The conclusions of the engineering self-assessment followup were particularly troubling in that little progress was observed in resolving many self-assessment findings. For example, the followup concluded that managers and supervisors did not spend enough time coaching and providing guidance to subordinates, systems engineering performance still did not meet expectations, and procedural compliance and attention to detail continued to be a problem.

Several examples of an inadequate safety focus and lack of a questioning attitude indicated that the licensee was not fully effective in conveying clear standards to the engineering organization; specifically in the areas of procedure adherence, operability evaluations, and 10 CFR 50.59 evaluations. Procedural violations led to the inadvertent loss of safety function when secondary containment was breached and when an emergency diesel generator was rendered inoperable. Also, the licensee occasionally failed to identify the need for operability evaluations, and a lack of rigor was noted in many instances. For example, a poor, informal operability assessment led to a core spray valve being inoperable for an extended period. Continuing failures to perform required evaluations represented potentially significant challenges to plant safety, overshadowing improvements in the quality of some evaluations. The licensee failed to perform a 10 CFR 50.59 evaluation in support of in-core fuel sipping activities and failed to perform an operability evaluation for plant operation without installation of the ice deflector for the intake structure, activities that were performed in a manner different than as described in the Updated Safety Analysis Report (USAR). Early in the assessment period, the licensee failed to recognize that a past unauthorized modification to the main steam tunnel blowout panels increased the pressure relief point, effectively changing the function of the panels as described in the USAR. Past unauthorized modifications continued to be identified throughout the assessment period.

Continuing problems were noted in the corrective action program, an area of weakness in the last assessment. Examples included a poor root cause evaluation of the failure of a service water motor-operated valve, multiple failures to promptly evaluate and correct a degraded emergency diesel generator muffler bypass valve, and inadequate corrective actions regarding the potential for water hammer in high pressure core injection piping. In

contrast, broad corrective actions initiated in response to self-identified fire protection design deficiencies resulted in the identification of numerous additional safe shutdown fire vulnerabilities by the licensee.

The licensee continued to be challenged in addressing design basis questions, despite the considerable progress made in the Design Criteria Document program. There were several instances where engineering efforts were inadequate, such as the failure to recognize the adverse impacts of plant changes on the operation of the standby nitrogen system and the inability to determine the basis for a reactor core isolation cooling pressure relief valve setpoint. Errors in the USAR continued to be identified by the NRC and the licensee. Both the NRC and a licensee design control audit team concluded that corrective actions to resolve the numerous USAR discrepancies have generally been ineffective, due, in part, to the lack of ownership. The safety system functional inspection conducted late in the SALP cycle identified additional examples in which the USAR was not updated to reflect current plant design.

Engineering interfaces with other plant organizations showed some improvement, with good engineering support noted during the identification and replacement of a leaking fuel assembly. However, the licensee was unable to effect significant improvement in the performance of the system engineering function. A large workload and ineffective management of systems engineering resources were persistent problems. Engineering support to plant operations in day-to-day activities was generally improved, as indicated by the discoveries of an excessive setpoint on a relief valve and the presence of Teflon in the standby gas treatment system. Engineering support to maintenance continued to be weak in that incomplete evaluations were performed and the impact of maintenance activities on operability was not fully understood. Problems encountered in implementing modifications to the diesel generators during Refueling Outage 16 were primarily due to inadequate or incomplete design change packages. Engineering support for emergency response functions was not always effective; poor documentation of plant conditions, mixed quality of technical support, and poor coordination of priorities were observed during the emergency exercise.

Self-assessment and quality assurance performance in the Engineering area was very good; the Engineering self-assessment and the self-assessment followup were noteworthy efforts that reflected significant improvement in the ability to identify problems. The teams were well qualified and conducted independent, objective, and comprehensive reviews that produced many outstanding findings. In addition, Quality Assurance involvement in the motor-operated valve program was extensive, audits of engineering programs were critical and broad in scope, and Quality Assurance followup of valve vendor design control was very strong and timely. However, management was not effective in resolving self-assessment findings, as discussed above, nor in resolving Quality Assurance findings in many cases.

The licensee significantly improved the quality of the motor-operated valve program and successfully completed actions in accordance with NRC Generic Letter 89-10, although

considerable involvement on the part of the NRC was necessary. The licensee's operating experience review program was effective in reviewing, tracking, and responding to industry events.

In general, the licensee's formal review committees, the Safety Review and Audit Board and the Station Operations Review Committee (SORC), were effective in the oversight of licensee activities. The performance of the SORC improved significantly from the last assessment period, as demonstrated by the committee's rejection of several of engineering's operability evaluations for a diesel generator failure. However, the SORC failed to routinely review station operation to detect potential nuclear safety hazards, as required by Technical Specifications.

The Engineering functional area was rated SALP Category 3.

V PLANT SUPPORT

Overall safety performance in the Plant Support area continued to be good, with some significant improvements noted. This area consists of activities involving radiological controls, chemistry, emergency preparedness, security, fire protection, and housekeeping.

Performance in the radiological controls area continued to be good with improvement noted in the As Low As Reasonably Achievable (ALARA) program and in the training and certification of the health physics staff. The radiation protection program was generally well managed and implemented. Radiological controls management provided good oversight of in-plant work. Improved communication and coordination with other organizations was apparent. However, the lack of procedure adherence by workers and radiation protection technicians and the failure to conduct a radiation survey prior to entry into a high radiation area resulted in violations. The radiological controls organization had a good safety focus as evidenced by a trend toward reduced radiation exposures. Several significant ALARA initiatives were implemented or scheduled for implementation. Excellent results were achieved in keeping person-rem totals low. Total person-rem exposure for 1996, a nonoutage year, was the lowest in plant history. The radiation protection staff demonstrated good response to challenges, but were sometimes slow in correcting concerns identified during self-assessments. Problem identification and resolution programs were generally effective. Radiological control boundaries and access controls were generally effective. Good training programs were provided for personnel responsible for implementing the radiological controls programs. Upgrades and refinements were observed throughout the radiation protection program. Excellent self-assessments were performed. An effective radioactive waste management and reduction program was implemented. Performance was good in implementing the water chemistry and radiochemistry control programs, although sample handling techniques needed improvement.

Performance in the emergency preparedness area remained at a satisfactory level during the assessment period. The program was effectively managed and implemented. Progress was made in improving facilities and the emergency planning organization. The emergency

preparedness training and qualification program was satisfactorily implemented; however, the protective action recommendation training provided to emergency directors needed improvement. Problems were noted in the ability to alert personnel in high-noise areas to emergency conditions. The emergency response facilities were significantly improved, but additional attention was needed. Overall, emergency response organization performance during the biennial exercise was satisfactory, but opportunities for further improvement were identified by the licensee and the NRC. For example, an exercise weakness was identified involving failure to maintain continuous personnel accountability in the control room and Technical Support Center. Although the scenario used during the exercise was sufficiently challenging, the initial scenario submitted to the NRC was not challenging in several areas and was generally of poor quality. This indicated that corrective actions taken following the 1994 exercise were not fully effective. Audits and critiques were effective. Conducting a followup critique with exercise participants strengthened the overall critique process. The licensee had an effective program for identifying problems with emergency plan implementation during actual events. Correct and timely actions were taken during two unusual events during the SALP period.

Performance in the physical security program remained superior. The program was well managed with an effective self-assessment program. Security systems were properly tested and promptly maintained. An appropriate number of well qualified and trained security personnel were available to implement the physical security program. An Operational Safeguards Response Evaluation inspection conducted early in the assessment period demonstrated a high level of safeguards response capability. The thoroughness of the corrective actions in response to significant problems identified by the licensee in the access authorization and fitness-for-duty programs demonstrated effective management oversight.

Fire protection and housekeeping remained good, but licensee-identified problems involving compliance with fire protection requirements and the NRC-identified concerns with the control of transient combustibles indicated the need for continued attention to these areas. The response to an actual fire that occurred during an emergency drill was effective.

Quality assurance and self-assessment audits of all major plant support programs were generally thorough and focused on safety.

The Plant Support functional area was rated SALP Category 2.