

SYSTEMATIC ASSESSMENT OF LICENSEE PERFORMANCE (SALP)
TURKEY POINT NUCLEAR PLANT
50-250/96-99 AND 50-251/96-99

I. BACKGROUND

The SALP Board convened on September 6, 1996, to assess the nuclear safety performance of Turkey Point Units 3 and 4 for the period August 28, 1994, through August 17, 1996. The Board was conducted per Management Directive 8.6, "Systematic Assessment of Licensee Performance." Board members were Johns P. Jaudon (Board Chairperson), Acting Deputy Director, Division of Reactor Projects; Albert F. Gibson, Director, Division of Reactor Safety; and Frederick J. Hebdon, Director, Project Directorate II-3, NRC Office of Nuclear Reactor Regulation. This assessment was reviewed and approved by Stewart D. Ebnetter, Regional Administrator, NRC Region II.

II. PLANT OPERATIONS

This functional area addresses the control and execution of activities directly related to operating the plant. It includes activities such as plant startup, power operation, plant shutdown, and response to transients. It also includes initial and requalification training programs for licensed operators.

Overall performance in the Plant Operations area remained superior during this assessment period. Operator and unit performance were superior. Strong operator knowledge and ability were demonstrated during unit startups, shutdowns, event response, and transients. Site organizations supported plant operations well. Teamwork among maintenance, engineering, and plant support groups was effective, as demonstrated by strong refueling outage performance and event response team reviews. Timely and proactive operator response prevented unit trips following several feedwater regulating valve induced steam generator level transients. However, in one instance, a feed pump check valve failure caused a steam generator level transient which was not appropriately responded to by operations. Operators demonstrated strong equipment oversight and were proactive in dealing with abnormal equipment problems including safety injection pump, turbine control fluctuations, and rod control problems. Operator performance during planned and unplanned equipment outages demonstrated strong oversight and superior risk assessment, involvement, and knowledge.

Management at all levels demonstrated strong operations oversight, conservatism, and a sound approach to risk assessment. A very high level of accountability was evident throughout the organization. Shift operators and nuclear plant supervisors exhibited a questioning attitude, as demonstrated by technical issues and potential operability concerns raised to plant management. When negative trends or problems occurred relative to operator performance, management was aggressive in their response and actions.

The Quality Assurance (QA) organization and the safety committees made a positive contribution to plant operations. These organizations demonstrated a strong safety perspective and focus. QA independently reviewed plant events and human performance issues. Their assessments and reports were of superior quality and were used by line management to direct corrective actions. The on-site safety committee was effective in the review of all unit trips and provided recommendations to plant management for unit restart. The offsite safety committee continued to place great emphasis on safe plant operations.

The licensee maintained a strong commitment to risk management. This was evidenced by the control of infrequent testing and evolutions and of risk-related troubleshooting activities. Plant management was involved and approved all risk-related activities. Plant evolutions were well planned, briefed, and executed. When appropriate, an evolution manager and director were assigned to complement the control room shift organization. Unit risk minimization during outage periods was evidenced by use of a risk assessment team, waiting until the core was off-loaded before going to reduced inventory or mid-loop, and maintaining most safety equipment operable from unit shutdown to cavity floodup in Mode 6.

During the assessment period, the licensee experienced numerous changes of personnel, including licensed and non-licensed operators, management, and supervisory positions. New managers and supervisors were assigned as the site vice president, plant and operations managers, and operations supervisor. Also, a number of licensed personnel were promoted to nuclear plant supervisory positions. Frequent and extensive personnel changes could present a challenge in sustaining the superior level of performance. Further, the results of the most recent operator licensing examination performance were mixed. Maintaining the quality of the training program for operator licensing, especially for large classes, is also a challenge for Turkey Point.

The Plant Operations area is rated Category 1.

III. MAINTENANCE

This functional area assesses activities associated with diagnostic, predictive, preventive, and corrective maintenance of plant structures, systems, and components. It also includes all surveillance testing and other tests associated with equipment and systems operability. Overall performance in this area was superior during this period.

Effective maintenance programs were evident and were considered a strength. These programs included the flow-accelerated-corrosion program, which was found to be detailed, proactive, and well administered, and an effective primary and secondary leak reduction program. Maintenance backlogs continued to be very low, and few control room deficiencies existed. Operator work-arounds were also minimal.



The previous SALP report identified a concern with balance-of-plant (BOP) equipment failures or degradation causing numerous power reductions and plant shutdowns. There were fewer BOP failures during this period indicating that licensee actions were effective in correcting this prior challenge.

Performance during refueling outages was also considered a strength. Three refueling outages were performed this period. The staff found that outage work was performed well, detailed procedures were used, and the personnel were knowledgeable and well trained. Reactor pressure vessel work was especially well performed.

Teamwork was considered a significant strength. Teamwork was evident during spent fuel pool work, integrated safeguards testing, and outages. This was considered a strength during the previous SALP period as well. Interchange of personnel between maintenance and engineering aided teamwork.

It was noted that the material condition of the steam generators has continued to be superior following replacement in the early 1980s. Very few tubes are plugged, demonstrating the effectiveness of the chemistry program. Complete inspection of the steam generators was performed for each unit during this period.

Instrumentation and Control (I&C) performance was considered a challenge. Management issued an I&C work stoppage in late 1995 as the result of poor I&C performance, demonstrating proactive and aggressive actions to correct the problems. Problems encountered in this area included an ESF actuation caused by I&C personnel during setup for testing, weaknesses in procedures, numerous minor personnel errors, configuration control deficiencies, and pressurizer pressure calibration inaccuracies. Turnover of personnel in the I&C area, including supervisors, continued to be high. Some improvement in I&C performance was observed toward the end of this period.

The maintenance area is rated Category 1.

IV. ENGINEERING

This functional area assessed activities associated with the design of plant modifications and engineering support for operations, maintenance, surveillance, and licensing.

The licensee's performance in Engineering was superior during this rating period. Programs for design control were effective in maintaining the plant configuration consistent with its documented design basis. Emerging design issues were addressed effectively. Modifications were based upon reducing design vulnerabilities and improving plant safety and reliability. Design configuration control with regard to the Updated Final Safety Analysis Report (UFSAR) was deficient with regard to practices with the spent fuel pool and the procedures used for off-loading spent fuel. The licensee promptly

completed a safety analysis to support the refueling outage normal practice of full core off-load to the spent fuel pool and are revising the UFSAR. A substantial UFSAR review program was initiated by the licensee. Continued management attention in this area is warranted.

Engineering continued to demonstrate a high regard for aggressive resolution of plant operational issues. Solutions to operational problems were prompt and comprehensive. Day-to-day support was strong with the proper attention given to safety issues. Support to outages was well planned and organized. Engineering's follow-through on emerging issues contributed to improvements in plant reliability and safety. Engineering demonstrated appropriate sensitivity to safety in several areas including emergency diesel generator reliability and control of biofouling in cooling canals.

During this SALP period the licensee completed three refueling outages. All three outages were completed efficiently and effectively. Controls were evident to ensure plant modifications not only preserved the design bases, but also ensured that modifications were installed properly without adversely impacting plant operations. System engineering involvement contributed to good performance in this area. Outage modifications were well planned, installed and documented.

Engineering demonstrated strong involvement and interface with other organizations. Good teamwork was observed between engineering and other organizations in many areas including outages and modification testing.

System and component engineers displayed good knowledge of system and equipment design and operation. They were knowledgeable of the current status of their assigned systems and demonstrated an understanding of the importance of maintaining the design bases. Ownership by system engineers was evident in many areas. Problem resolution was effective, and good use was made of component engineers.

Most Engineering output products were timely, well written, and complete. Monthly operating reports were timely with detailed information. Responses to Condition Reports were also timely and included detailed evaluations. Periodic special reports were complete and accurate. Licensee Event Reports (LERs) were timely, well written, complete and accurately documented the events. Plant Change Modifications (PC/Ms) packages were adequate for good implementation of modifications. The overall quality of licensing submittals was satisfactory, but some contained administrative errors.

Engineering conducted good self assessments. Engineering's report card system, which was an evaluation of their own performance, continued to be challenging and motivating for the organization. Post-outage critiques by Engineering were strong. Quality Assurance audits and performance monitoring were effective, and corrective actions were accomplished as needed.

Late in the SALP period, the licensee completed consolidation of engineering resources at the site from corporate, assigned a new Engineering Manager, and eliminated the position of Technical Support Manager. Because these organizational changes are so recent, the NRC has not observed the full impact of these changes. Managing these changes to maintain the level of Engineering performance in the future will present a challenge.

The engineering area is rated Category 1.

V. PLANT SUPPORT

This functional area addresses all activities related to plant support, including radiological controls, radioactive effluents, chemistry, emergency preparedness, security, and fire protection.

The radiological control program was effective in controlling radiation exposures of plant workers and members of the public. Internal and external radiation exposures were below regulatory limits. Site "As Low As Reasonably Achievable" measures were successful throughout the monitoring period. The licensee has implemented an effective program for handling, packaging and transporting radioactive materials and shipments of radioactive materials were properly prepared for transport. The licensee was also successful in reducing the amount of plant area which was contaminated, minimizing the generation of low level radioactive waste and reducing the number of personnel contamination events. The licensee's corrective action responses to minor radiation control program violations were generally timely, appropriate, and thorough.

Exposures of members of the public to radiation were limited by maintaining radionuclide concentrations in liquid and gaseous effluents at a small percentage of their regulatory limits. The licensee implemented and maintained an effective program to monitor and control liquid and gaseous effluents. The projected offsite doses resulting from those effluents were well within the limits specified in requirements. The effectiveness of the effluent controls was confirmed by the results of the environmental monitoring program in that only trace amounts of radioactivity were detected in the samples collected from the environs of the plant.

Chemistry control programs for monitoring primary and secondary water quality were implemented in accordance with the Technical Specifications requirements. The licensee maintained an effective overall chemistry program to inhibit degradation due to corrosion/erosion of components of both the primary and secondary systems. The strong secondary chemistry program and related controls have resulted in minimum plugging of steam generator tubes. Through confirmatory measurements, licensee demonstrated maintenance of a high quality radiochemical analysis program.

During the NRC observed, graded emergency response exercise, the licensee demonstrated the capability to protect the health and safety of facility personnel and the general public. Several improvements were made in communication capabilities in the emergency facilities, and several of the enhancements were observed during the most recent NRC graded exercise. The licensee was proactive in the area of hurricane preparedness. Licensee preparations for Hurricanes Erin (July 1995) and Bertha (July 1996) were conducted in a proper and timely manner, demonstrating good planning.

The licensee continued to have a strong, well-managed security program. Protected area equipment was reliable, functioning with few problems, and met the requirements of the Physical Security Plan. Security management was proactive in recognizing potential weaknesses and continued to have good communication with the contract security force. Human performance and thorough audits were program strengths.

The Fire Protection Program was well implemented during this SALP cycle. Organization and administration of the fire protection program were good. The controls provided for ignition sources and transient combustibles were good. Maintenance, testing and performance of the fire protection systems and equipment were good. When problems were identified, appropriate corrective action was promptly initiated.

This Area is rated a Category 1.