

SYSTEMATIC ASSESSMENT OF LICENSEE PERFORMANCE REPORT

SURRY NUCLEAR PLANT

50-280/96-99 AND 50-281/96-99

I. BACKGROUND

The SALP board convened on October 23, 1996, to assess the nuclear safety performance of the Surry Nuclear facility for the period January 22, 1995, through September 28, 1996. The board was conducted in accordance with Management Directive 8.6, "Systematic Assessment of Licensee Performance." Board Members were J. R. Johnson (Board Chairperson), Acting Division Director, Division of Reactor Projects, A. F. Gibson, Director, Division of Reactor Safety, and F. M. Reinhart, Acting Director, Project Directorate II-1, Office of Nuclear Reactor Regulation. This assessment was reviewed and approved by the Regional Administrator.

II. PLANT OPERATIONS

This functional area addresses the control and execution of activities directly related to operating the facility. 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 continued to remain strong during this assessment period. Management support to and oversight of day-to-day plant operations remained excellent. Few plant transients were caused by operator errors and actions were taken to address certain procedural and tagging issues identified during the period.

Control room professionalism remained superior. A quiet, formal environment was consistently maintained. Operations management as well as engineering and maintenance support to control room operations was clearly demonstrated by routine avoidance of lit annunciators and a minimum of other control room equipment or instrumentation deficiencies. Digital upgrades were provided for older instrumentation. Operator workarounds were closely monitored with actions taken or planned to resolve them.

Conservative operational decisions demonstrated a strong safety focus. Improved performance in making prompt operability reviews for potential common mode problems was noted later in the period. Preparations for the impact of severe weather were well planned and conducted.

ENCLOSURE

Additional management and supervisory oversight which was provided in the control room during planned transients was noted as a strength.

Excellent communications were demonstrated during plant maneuvers. Routine power operations as well as shutdown operations were characterized by effective pre-evolution briefings and well-monitored activities. Good shift-supervisory oversight was exhibited with one exception during a refueling outage early in the period. Close on-shift operations management support during a refueling outage later in the period demonstrated effective lessons learned and effective corrective actions. Control of overtime was effective during outages and excellent control of post-outage plant startups was demonstrated.

Self-assessment activities continued to be effective in identifying and correcting deficiencies. Plant operators demonstrated good questioning attitudes not only during control room evolutions but also during plant tours. A visiting operator from another licensee facility identified a long-standing error with hydrogen analyzer switch positions and plant operations management continued to closely assess individual operator performance.

Operators were generally knowledgeable, alert, and responded well to challenges caused by a number of equipment failures and reactor trips. Performance during both initial licensing examinations and requalification program reviews indicated a good licensed operator training program. Weaknesses were noted, however, during routine operations in the level of knowledge of certain Technical Specification requirements and other operational limitations.

Performance during the conduct of isolating plant systems and equipment for maintenance and testing indicated that the area of attention to detail noted in the previous SALP period remained a challenge. Operations management, as well as the independent oversight staff, recognized this trend and took initiatives during the latter part of the period to conduct re-training on the fundamentals of component tagging and equipment isolation. Licensee monitoring of personnel errors showed a decreasing trend late in the period.

The Plant Operations area is rated Category 1.

III. MAINTENANCE

This functional area addresses activities associated with diagnostic, predictive, preventive and corrective maintenance of plant structures, systems and components. It also includes all surveillance testing, in-service inspection and other testing associated with equipment and system operability.

Strong management involvement and support were evident in an effort to improve maintenance performance and to upgrade the material condition of the plant. An additional management position at the Assistant Superintendent level was created in the Maintenance Department, rotation

of personnel in supervisory positions was implemented, and a "fix it now" program was initiated to reduce delays in effecting repairs. Management continued to implement significant upgrades of the material condition of the plant. These included capital improvements, such as replacement of traveling screens at the upper and lower level intake structures and replacement of feedwater pump motors. The switchgear room air conditioning was upgraded, and analog controllers were in the process of being replaced with more accurate digital controllers. These and other improvements have corrected a number of long-standing equipment problems.

Work controls and careful planning permitted timely repairs. Contingency plans prevented unexpected delays. Good coordination and pre-job briefings focussed on safety and minimized the risk from maintenance activities to the plant and to workers.

Teamwork and communications continued to be a strength. There were numerous examples of effective communications among Maintenance and support staff, including interfacing staff from Operations and Engineering. System engineers, operators, and maintenance technicians coordinated effectively. Excellent technical support was received, especially from Engineering.

Human performance deficiencies, especially in mechanical maintenance, remained a challenge during the period. These included routine tasks, such as repacking pump seals, and a potentially more significant "wrong unit" work error. These deficiencies, and other personnel errors during maintenance and testing activities, were caused by lack of concentration, inattention to detail, and inadequate oversight.

Although the procedural upgrade program continued, procedural deficiencies in maintenance challenged the plant. Lack of detailed procedures resulted in flooding of the turbine building. In one case restoration from surveillance testing did not place monitoring equipment in a standby condition because of an inadequate procedure. Some of the deficiencies appeared to be the result of old practices and are gradually being eliminated.

Equipment failures continued to challenge the plant throughout 1995, but improvement appeared in 1996. A number of plant trips and power reductions were caused by equipment failures. Maintenance-driven entries into containment caused radiation exposure to workers that could otherwise have been avoided. Management's efforts to upgrade equipment appeared to be showing some positive results late in the SALP period.

A strong self-assessment program provided a basis for improvements in the maintenance area. Root cause evaluations were thorough. Problem identification was a strength. Station level self-assessments were completed in several maintenance-related areas. The deficiency report program worked well.

The Maintenance area is rated Category 2.

IV. ENGINEERING

This functional area includes activities associated with the design of plant modifications and engineering support for operations, maintenance, and outage activities. Performance in this area was superior and contributed to excellent performance in other functional areas.

Design control and configuration control efforts were effective. Overall design configuration was evaluated by thorough management reviews. Problems noted with the accuracy of the Updated Final Safety Analysis Report (UFSAR), and the process used to maintain the UFSAR current, were being addressed.

Several long-standing design problems were identified and modifications were made to correct them. Significant modifications were made to improve plant reliability. Engineering technical programs for support of activities such as fire protection, in-service inspection, and procurement were of high quality.

Evaluations were thorough, addressed root causes, extent of condition, and addressed proper corrective actions. One notable self-assessment was conducted for the Unit 2 startup from a refueling outage. That assessment was focussed on assuring plant safety. A long-standing issue regarding rod control cabinet environment was resolved; however, the continuing weld cracking in the letdown line remained unresolved.

The quality of engineering output products was excellent. Design changes were accurate and effectively implemented. Safety evaluations were accurate, thorough, and comprehensive. Safety evaluation implementing procedures were of high quality and were followed. Several temporary modifications were implemented with good safety evaluations. Training on safety evaluations was current. Licensing submittals were of high quality with good hazards evaluations. Engineering provided timely response to questions regarding licensing submittals.

There was good teamwork between Engineering and other site organizations. Outage support was effective with Engineering performing multiple reviews of schedules and activities.

Engineering implemented an effective equipment trending program. This program identified several conditions where testing, monitoring, and replacement should be conducted. Actions were taken based on these findings to improve plant reliability. Engineering provided Maintenance

with valuable inputs for in-service testing, welding and snubber maintenance. These programs were enhanced by Engineering's support.

The Engineering area is rated Category 1.

V. PLANT SUPPORT

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

The radiological control program was implemented well and resulted in effectively protecting the health and safety of the plant workers and members of the public. Both the internal and external radiation exposures were maintained well below regulatory limits and continued to decline. Good contamination control was demonstrated by maintaining contaminated plant area square footage low. An effective self-assessment and audit program was implemented. The As-Low-As-Reasonably-Achievable (ALARA) program was satisfactory. Goals for the five year ALARA Plan were met. The use of measures such as "hot spot" reduction, telemetry dosimetry and water chemistry pH control helped reduce dose; however, the operation of one unit with fuel failures created additional ALARA challenges. Radiation Work Permit (RWP) worker compliance remained a challenge.

The effluent control program was effective in limiting exposure to members of the public by maintaining radionuclide concentrations in liquid and gaseous effluents at small percentages of their regulatory limits. The effectiveness of the effluent controls was confirmed by the results of the environmental monitoring program. Shipments of radioactive materials were properly prepared for transport.

The chemistry control program functioned well in maintaining high quality primary and secondary cooling water.

The emergency preparedness program was generally effective in maintaining site readiness to respond to emergencies. One exercise weakness was identified during a 1995 full participation evaluated exercise. Improvements were identified during a followup drill observation. Improvement in the reliability of siren activation by the installation of uninterruptable power supplies to all offsite activation points was considered a program strength.

The Physical Security Plan, procedures and associated programs were implemented in an exceptional manner. The organization and administration of the security program reflected the outstanding professionalism and dedication of the security management and security force. Access control equipment was effective. Plant and security management were active in recognizing, analyzing and correcting potential problems.

The fire protection program was adequately implemented. Controls provided for ignition sources, transient combustibles and housekeeping were satisfactory. Maintenance, testing and performance of fire protection systems and equipment as well as the fire protection training program for the fire watch and fire brigade personnel were effective. Fire brigade performance during drills was satisfactory. Quality assurance audits of the fire protection program were thorough and well documented and appropriate corrective action was initiated when problems were identified.

The Plant Support area is rated Category 1.