

# SYSTEMATIC ASSESSMENT OF LICENSEE PERFORMANCE REPORT

## SURRY NUCLEAR STATION

50-280/95-99 AND 50-281/95-99

### I. BACKGROUND

The SALP Board convened on February 2, 1995, to assess the nuclear safety performance of Surry Units 1 and 2 for the period July 4, 1993, through January 21, 1995. The Board was conducted per Management Directive 8.6, "Systematic Assessment of Licensee Performance." Board members were J. P. Stohr (Board Chairperson), Director, Division of Radiation Safety and Safeguards; E. W. Merschoff, Director, Division of Reactor Projects; A. F. Gibson, Director, Division of Reactor Safety; and D. B. Matthews, Director, Project Directorate II-2, NRC 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 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.

Management oversight and involvement were effective during the SALP period, and were characterized by conservative decisions and safe operations. While the plant was challenged by six trips during this period due largely to equipment failures, operators' response to these events was well controlled, focused on safety, prompt, and thorough.

The Station Nuclear Safety Operating Committee consistently provided thoughtful review of issues at the appropriate threshold. In addition, reviews associated with temporary leak seal repairs added value to these efforts, in that issues not recognized by the line organization were identified and subsequently addressed. Management fully supported operational personnel and established high performance standards. Prudent testing was initiated for problems associated with the turbine driven auxiliary feedwater pump. Management's onshift oversight during plant heatups and startups illustrated a strong commitment to plant safety. Shift operations were well controlled with conservative decisions made to control the tempo of operations during steam generator level oscillations. Early in the SALP period, an inadequate evaluation of a reactor coolant system leak resulted in Unit 1 operating with a non-isolable reactor coolant leak. However, conservative actions taken on a subsequent increase in leakage rate resulted in the ultimate detection, analysis and repair of the leak prior to exceeding allowable leakage limits.

Operations personnel performance was excellent throughout the assessment period. Plant evolutions such as shutdowns and startups, reactor trips, power operations and transients were conducted in a highly professional and competent manner. Excellent command and control of the evolutions and the frequent use of feedback communications indicated that management expectations were fully understood. To assure successful evolutions, effective pre-job briefings were consistently conducted. During shutdowns, occasional communication deficiencies contributed to personnel errors involving loop stop valve operation and control of the dilution flow path.

Both the initial licensed operator and operator requalification training programs were satisfactorily implemented. Six of seven personnel tested for initial licensing successfully passed the examination. The training skills learned in the simulator were also evident during plant evolutions. Operators were knowledgeable of plant systems and used procedures successfully.

The operations organization was effectively supported by the station. Engineering and Maintenance support to emerging problems was prompt and effective in assuring operators' ability to manage problems with a conservative safety attitude. Self assessment has remained effective throughout the period due, in large part, to the extensive involvement in and ownership of the assessment program by the operations line management.

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, inservice inspection and other tests associated with equipment and system operability.

Management continued to maintain a strong commitment to upgrade the material condition of the plant. Significant progress was made in reducing leaks, improving coatings, and refurbishing damaged and corroded equipment. Several longstanding and recurring equipment problems were corrected. Examples included replacement of pressurizer safety valves and component cooling water heat exchangers. Effective engineering support and root cause analyses were important contributors to success in this area.

The procedure upgrade program, initiated in a previous SALP period, was continued. Although procedural deficiencies continued to cause problems, the quality of procedures steadily improved.

Plant systems and components were appropriately tested to assure they would function properly in service. Effective programs were implemented for post maintenance, inservice, and surveillance testing. Programs for diagnostically testing motor operated valves, predicting piping

degradation due to erosion and corrosion, and verifying the heat transfer capability of service water heat exchangers were also effective.

Teamwork contributed to good maintenance performance. NRC inspectors noted numerous examples of effective communications between operations and maintenance during pre-job briefings and during the accomplishment of maintenance activities. Engineering assisted Maintenance in the resolution of recurring equipment problems.

Human performance deficiencies in the implementation of maintenance and testing programs remained a challenge during this S&LP period. Such deficiencies caused an automatic reactor trip, a manual reactor trip and power runbacks. These deficiencies, and other personnel errors during maintenance and testing activities, were caused by lack of attention to detail and failure to follow procedures.

Equipment failures were also a challenge. Several reactor trips, forced outages and power reductions were caused by equipment failures. Most occurred in the balance-of-plant equipment and some could have been prevented by more effective preventive maintenance of aging plant equipment.

Self-assessments were a strength. The line organization candidly assessed performance trends using the performance annunciator panel program, and the QA organization provided daily performance reports to station management. The plant staff maintained a low threshold for identifying problems as indicated by the large number of deficiency reports generated. Audits and assessments by the QA organization provided valuable performance feedback to station management. Corrective actions taken in response to specific problems identified by self-assessments were generally timely and effective.

The Maintenance area was rated Category 2.

#### IV. ENGINEERING

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

Management demonstrated a strong commitment to providing high quality engineering and technical support in maintaining safe plant operations. In general, conservative and appropriate decisions were made by management with respect to operations, maintenance and surveillance activities.

Engineering and technical support in resolving emerging issues in support of reliable plant operation was generally good. Trending and evaluation of the steam generator water level oscillations was comprehensive, timely, and provided valuable information to the operations staff. Engineering evaluation of a proposed modification to the 2A station battery was sound. Operations, maintenance, and



engineering personnel coordinated efficiently to minimize the amount of time the station battery was out of service and to complete the temporary modification in a controlled manner.

A strong engineering training program was exemplified by the number of engineering personnel with Senior Reactor Operator or Shift Technical Advisor certificates. Management focused attention on engineering backlog control which yielded good results by reducing the number of backlog packages.

Licensing submittals were timely and of high quality, demonstrating thorough understanding of the technical issues and regulatory requirements. Responses to NRC Generic Letters adequately addressed issues of concern.

During the period, there were some problems which indicated a need to improve communications between engineering and station personnel. Examples were an error relating to the main steam calorimetric computer program setpoint, because the impact of the refined main steam scaling values was not recognized by all involved parties; and an incident relating to the gradual degradation of a station battery.

The self-assessment program was well organized, effective, and performed by knowledgeable people. Assessments were effective in identifying a number of areas for improvement in the engineering group. Corrective actions in response to the audits and assessments were developed to address the improvement areas. The review of the Technical Specifications and implementing procedures was thorough and significantly improved the quality of the surveillance program.

The Engineering area was 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 controls.

The radiological control program continued to provide an excellent level of protection for plant workers and the environment during this SALP period. Proactive As Low As Reasonably Achievable (ALARA) efforts resulted in collective dose savings and supported the continued downward trend in collective dose for the site. ALARA initiatives included the effective use of permanent shielding on operating systems, hot spot reduction and refinements to shutdown chemistry. There was strong management and worker involvement in support of the program. Radiological contamination control practices continued to be aggressive and supported the effective control of internal exposures during the period. Self audits of the radiological protection, chemistry, radioactive waste, and transportation programs were comprehensive and well documented. Corrective actions for audit findings were appropriately implemented. Effective implementation of the primary and

secondary chemistry programs maintained primary parameters well within technical specification limits and reduced the source term during outages. Radiological effluents were also effectively controlled. Overall, radiological work procedures were good. During the period there were several instances of failure to comply with procedures and related controls.

Performance in the Emergency Preparedness area continued at an excellent level during this period. The response organization performed effectively during emergency exercises in 1993 and 1994 and responded effectively to four events classified at the Notification of Unusual Event Level. Event recognition, classification and Emergency Plan implementation were appropriate. The training program continued to be effectively implemented, supporting the excellent response performance. There was strong management support for the program. Self audits of the emergency response program were detailed and comprehensive with good assessments of Emergency Plan implementation. Findings, including those from exercise critiques, and corrective actions were tracked. Good support was provided for offsite response agencies. During the period, the area of radiological dose assessment was identified as needing improvement.

The Physical Security Program continued to be implemented in an excellent manner during this period. The security staff was well trained and qualified and implemented security plan requirements in a professional manner. Security barriers were effectively maintained with excellent maintenance of the security equipment. Self-audits were thorough and effective in identifying issues and areas for improvement. Security Plan changes submitted for review were thorough and timely. The Fitness-for-Duty program was considered a strength.

General overall housekeeping practices during the period were good. Plant surface coatings and reclamation activities improved the appearance of the plant and have heightened personnel awareness of housekeeping situations needing attention.

The Plant Support area was rated Category 1.