

SYSTEMATIC ASSESSMENT OF LICENSEE PERFORMANCE REPORT
CATAWBA NUCLEAR STATION
50-413/95-99 AND 50-414/95-99

I. BACKGROUND

The SALP Board convened on October 24, 1995, to assess the nuclear safety performance of Catawba Nuclear Station for the period October 3, 1993, through October 7, 1995. The Board was conducted in accordance with Management Directive 8.6, "Systematic Assessment of Licensee Performance." Board members were J. R. Johnson (Board Chairperson) Deputy Director, Division of Reactor Projects; A. F. Gibson, Director, Division of Reactor Safety; and H. N. Berkow, Director, Project Directorate II-2, 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.

Overall performance in the plant operations area during the assessment period has been good. Performance by plant operators in response to a significant number of plant trips and power runbacks was good. Operations management effectively addressed previous SALP concerns with the quality of emergency operating procedures and weak abnormal operations performance during initial and requalification training. Procedural adherence related problems noted in the last SALP were not as prevalent during this assessment period.

The quality of operators' performance in the mid-SALP period was poor, with multiple personnel errors involving valve tagging, self-checking, and interpretations of Technical Specifications by licensed operators. Performance during the last five months of this period has shown improvement. This was due, in part, to improved standards being set and additional station management oversight.

The safety focus of on-shift personnel was generally good. Safety system operability decision-making was conservative. Effective compensatory actions were established when degraded equipment performance was identified. Although implementation of shift briefings and on-line maintenance activities were inconsistent, they improved toward the end of the period.

Operators identified and assured resolution of plant equipment problems affecting operations. Operator workarounds were minimized and control room instrumentation was kept in good working condition. A dark annunciator panel policy was aggressively implemented, thereby minimizing distractions to control room operators.

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Plant administrative controls, as well as simulator modeling to support outage operations training, continued to provide an excellent framework to minimize risk during plant shutdown operations and outages. As a result, risk was minimal for those several instances where shutdown cooling system operation was challenged.

Management involvement in operator simulator training programs has been effective. Operations management expectations were effectively communicated for emergency conditions, as evidenced by more than 30 simulator evaluations in 1995 and good in-plant transient response. This contrasts with weak management involvement in day-to-day in-plant activities. Routine in-plant performance suffered because questioning attitudes, accountability, and tagging control were not routinely reinforced.

The effectiveness of operations' self-assessments, as well as Plant Operations Review Committee (PORC) safety reviews, were inconsistent. Routine plant operations' assessments were not rigorous and did not identify the need to assure better staff support for on-shift operations. The Problem Identification Process also had limitations with respect to trending problems associated with human performance. Additionally, PORC did not identify weaknesses in special operations activities to ensure that they were technically sound and properly controlled.

A number of initiatives were taken in the latter part of the period by station management which focused on improving plant operations. Some improvement was noted in the use of independent verification and self-checking, as well as an improved questioning attitude by operators (particularly when interfacing with engineering and maintenance personnel).

The Plant Operations area is rated Category 2.

III. MAINTENANCE

This functional area addresses activities related to 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.

Although several plant transients were caused by equipment failure, the reliability of plant equipment improved over the period. Reflective of effective maintenance and testing, safety systems consistently performed well when called upon and their unavailability remained low.

There were weaknesses associated with maintenance and surveillance programs during the assessment period. These weaknesses included not adhering to procedures, poor work control and surveillance scheduling, lack of operations reviewing work requests, and an unstructured

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troubleshooting process. Failure to follow procedures and work practice deficiencies, especially mechanical maintenance during refueling outages, caused equipment failures or adversely affected facility operations. Similarly, ineffective planning and implementation of a new work control process late in 1994 resulted in several operational events.

Licensee management initiatives were implemented to address the aforementioned program weaknesses. A Failure Investigation Process was developed and implemented to bring structure and engineering involvement into the process for troubleshooting complex failures. Surveillance test scheduling and tracking was centralized with improved accountability for program implementation. Work control scheduling self-assessment processes were established. Human performance improvement initiatives were implemented and consistently reinforced by station management. In addition, a risk-based review of ongoing maintenance activities was implemented. Although human performance deficiencies remained a challenge, the above program initiatives resulted in improved performance toward the end of the assessment period.

Self-assessments were normally effective once the operational event threshold was reached. Corrective actions to address programmatic deficiencies significantly strengthened several maintenance programs. Individual problems identified in the Problem Investigation Process were not always trended and fully assessed to identify programmatic deficiencies, but performance in this area improved late in the period.

The Maintenance area is rated Category 2.

IV. ENGINEERING

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

Engineering performance continued to be good during the period. The major reorganization of corporate and station engineering was completed early in the period. The new organization stabilized and functioned effectively. Challenges identified in the previous SALP were effectively addressed.

Engineering support to operations was uneven. Strengths were evident in the support to shutdown risk operations, in the recovery plans for malfunctioning equipment while at power, in most engineering support to testing activities, and in the prevention of operational problems with the existing degraded Unit 1 steam generator tubes. However, instances of failure to appropriately communicate or take timely corrective action on the basis of off-normal test or operational data contributed to inoperable equipment and facility transients, indicating the need for continued improvement in human performance.

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Implementation problems related to deficiencies in the development of some modifications were evident throughout the period. Improved modification quality was achieved later in the period through additional management focus, cross-disciplinary review, applying an operational perspective, and independent review and monitoring.

Engineering support towards maintaining plant systems and equipment was good. The availability of key safety systems remained high. Engineering backlogs were significantly reduced. Effective corrective actions were underway to address long-standing equipment problems with optical isolators and circuit boards. However, corrective actions on several other issues, such as component cooling water pump deficiencies, were not as timely.

Although trending limitations were addressed in the functional areas of plant operations and maintenance, the Problem Investigation Process was an effective tool to document problems. It was augmented by a Failure Investigation Process, a structured process for the more complex root cause determinations, which enhanced engineering support to maintenance. Also, system engineer review of test results, System Health Reports, and licensee self-assessments aided the identification and resolution of deficiencies. Once problems were recognized, resolution was normally good.

Licensee actions reflected a good safety focus. Management initiatives to further strengthen the safety focus included the Accountability Planning and Appraisal process, which established specific organizational and personnel goals and accountability down to the individual performance appraisal level.

The quality of licensing submittals was generally good. The strongest area of performance was the corporate engineering activities in support of the steam generator replacement project. Notwithstanding the previously provided guidance for preparing relief requests, some initial requests for relief from ASME Section XI testing and inspection requirements were insufficient to support a review. On all such occasions, once an inadequacy was identified, the licensee acted quickly to resolve the issue.

The Engineering area is rated Category 2.

V. PLANT SUPPORT

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

Overall, the radiological control program was effectively implemented. Individual exposures were maintained within regulatory limits and good

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radiological control performance was apparent in most routine and high radiation exposure activities. Management and staff were qualified and supported by an effective training program that focused on improved worker awareness of plant challenges. Detracting from performance in radiological controls was a lack of procedural adherence and overall inattention to detail.

There were problems minimizing radiation exposure and contamination control, especially during refueling outages. Collective radiation dose was adversely impacted during each refueling outage of the assessment period due to instances of ineffective planning and control. Annual personnel contamination goals were exceeded during the period, in part due to ineffective contamination control practices. Also, radiological controls associated with radiation area postings and surveys were occasionally weak. Self-assessments in the radiation protection area were minimally effective, with improvement noted late in the period.

The radiological effluent control program remained effective with no unplanned releases during the period. All routine gaseous and liquid releases and associated doses to the public were maintained to a small fraction of regulatory limits. Programs implemented to monitor releases of radiological effluents to the environment were effective and assured that plant operations caused negligible impact to the environs of the plant. All system chemistry parameters were maintained well within requirements.

Consistent superior performance was demonstrated in all key elements of the emergency preparedness program. The emergency response organization was maintained in a high state of readiness throughout the period as demonstrated during numerous self-initiated drills and exercises and one actual event. Overall training of emergency response personnel was a strength, with good management commitment evident in the program. Emergency response facilities and associated dedicated equipment, as evaluated during exercises, were fully capable of supporting an emergency response and represented a program strength. Emergency preparedness self-assessments, including exercise critiques, were effective in identifying and correcting problems. The level of cooperation and overall interface with offsite State and local authorities remained good.

Security program performance was good overall with training and qualification of security personnel identified as a program strength. Security equipment was maintained in a state of readiness sufficient to support postulated security events. Prompt corrective action to degraded security systems and equipment reduced the duration of compensatory measures. The security plan fully defined security requirements and, with rare exception, personnel properly implemented the security plan. Licensee management effectively addressed security challenges during the period associated with the adequate control of safeguards information and unsecured vital area doors.

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Fire protection response capabilities were maintained in a good state of readiness. Effective maintenance of fire detection and suppression systems provided good fire equipment availability. Staffing levels for the fire brigade exceeded regulatory requirements. The fire brigade was well equipped and demonstrated an effective fire response capability during fire drills.

The Plant Support Area is rated Category 2.