

SYSTEMATIC ASSESSMENT OF LICENSEE PERFORMANCE REPORT

WATTS BAR NUCLEAR PLANT

50-390/97-99

I. BACKGROUND

The SALP Board convened on December 18, 1997, to assess the Nuclear Safety Performance of the Watts Bar Nuclear Plant for the period November 10, 1996 through December 6, 1997. The Board was conducted in accordance with Management Directive 8.6, "Systematic Assessment of Licensee Performance." Board members were J. R. Johnson, Director, Division of Reactor Projects, Region II; C. Casto, Deputy Director, Division of Reactor Safety, Region II; and F. J. Hebdon, Director, Project Directorate II-3, 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 startup, power operation, plant shutdown, and response to transients. It also includes initial and requalification training programs for licensed operators.

Overall performance in plant operations was good throughout this assessment period. Management was actively involved in daily operations and provided excellent oversight. A strong self-assessment process continued. Operator response to events was excellent. Configuration control problems and examples of lack of attention remained from the last period.

Daily conduct of operations was very good as operators were attentive to their duties to ensure safe reactor operations. Power operations, as well as shutdown plant operations, shift turnovers, and operator monitoring rounds were typically conducted with diligence and in accordance with procedures. Response to alarms was good and improved from the last assessment period. Plant startups and shutdowns were performed carefully; however, lack of attentiveness or inexperience, on occasion, resulted in unplanned transients. Other issues involving similar causes resulted in minor examples of lack of operator awareness of plant conditions, and were indicative of a plant continuing to develop operational experience and effectively implement lessons learned. Operators responded to plant transients and events in an excellent manner, demonstrating good knowledge of applicable procedures.

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Strong management involvement and support of plant operations were evident. Management review of activities, via various forums, emphasized conservative approaches and effectively considered risk. Managers maintained an active presence in the plant, overseeing both routine and sensitive activities.

Configuration control of plant equipment remained problematic from the previous assessment period. Operations initiatives had been implemented, with some improvement; however, component mispositions by non-licensed operators continued to occur, including examples found by the NRC which rendered safety equipment inoperable.

Management continued to ensure a strong and critical self-assessment program. Improvement was observed with review of industry events and other issues. The corrective action program effectively ensured that problems were identified and resolved. The training program effectively prepared operators for initial licensing and requalification.

The Plant Operations area is rated Category 2.

III. MAINTENANCE

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

Performance in the maintenance area was superior in supporting overall plant operations. Corrective maintenance activities were well controlled with only occasional human performance deficiencies. Response to emerging maintenance issues was strong, particularly during the recent outage. Maintenance was effective during the outage in eliminating operator workarounds and leaks which had contamination catch basins, in closing corrective maintenance items, and in maintaining low backlogs. Outage activities made good use of risk information with excellent preparation and execution for mid-loop operations. Most preventative maintenance activities were effective.

Overall calibration and surveillance activities were well planned and executed. Good procedural adherence was noted and personnel were knowledgeable. Self-assessments in the surveillance area were thorough. A number of surveillance deficiencies were identified and promptly corrected by the licensee resulting in improvements in the program. Nevertheless, there were some untimely surveillances and surveillance errors due to personnel error.

Maintenance activities resulted in a high level of safety equipment performance and reliability. Safety system availability was high with no significant failures of safety equipment during plant operation. Good material condition of the plant resulted in few equipment challenges to plant operation; however, failures in a main feedwater

pump and the main condenser resulted in operational transients; and in addition, instrumentation failures contributed to transients.

Outage activities included a significant amount of first-time inservice inspection and augmented inspection activities. Those evolutions were well performed, and resulted in improved system readiness including the replacement of a significant amount of secondary system piping.

Self-identification of problems, along with root cause determinations, was effective in improving compliance with requirements. Audit scope was focused with appropriate emphasis on identifying weaknesses and development of corrective actions. Field observations were emphasized resulting in very valuable conclusions and improvement initiatives.

The Maintenance area is rated Category 1.

IV. ENGINEERING

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

Overall performance in this functional area was superior. This period included the first cycle of operation and those engineering activities necessary to prepare for and implement the plant's first refueling outage. The engineering organization has continued to be effective in its support of the plant during these operations.

Numerous examples were noted of excellent engineering support to overall plant operations in the evaluation of plant transients and equipment problems. These issues included a wide range of subjects and reflected thorough investigations and a strong technical knowledge of the issues. Multiple instances were also noted wherein excellent communications between various organizational elements and high levels of management involvement contributed substantially to problem resolution.

System Engineer knowledge and performance continued to be a strength. The System Engineering Program was well defined in plant procedures. The program reflected support for the Maintenance Rule, good support for troubleshooting efforts and field support was generally well implemented.

The licensee consistently provided prompt corrective action, supported by thorough engineering reviews, for problems identified by the plant's operation. The licensee was also effective in response to generic issues such as Generic Letter 96-01, Testing of Safety-Related Logic Circuits and for other issues identified by the licensee's attentiveness to operating experience from other power plants.

Root cause assessments have shown improvement. There were several instances of less-than-adequate initial engineering resolutions that were followed by thorough root cause assessments upon reoccurrence of the problem. Several systems were involved, including main feedwater and diesel generator, some of which were resolved by effective root cause assessment and some of which were being followed by continuing licensee diagnostic efforts at the end of the period.

Licensee self-assessments in the engineering area were found to be thorough and beneficial with only minor problems. In addition, self-assessment processes implemented by the licensee's on-site review committees, to which Engineering is a contributor, continued as a strength.

The licensee's design control processes for several design changes implemented during the refueling outage were found to be strong. The modifications reflected acceptable 10 CFR 50.59 processes and were in accordance with applicable industry standards. The licensee also exited the refueling outage with a small engineering backlog in the areas of design changes and drawing updates.

During the latter part of the period, the licensee shut down the unit for the first refueling outage. Outage activities were implemented well especially considering the emergence of additional unforeseen work. Equipment performance has generally been strong, with the exception of problems with a main feedwater pump shaft. The plant generally operated well during the first fuel cycle with a limited number of transients.

The licensee submitted several applications for amendment of the license and made several submittals on other licensing issues. These submittals were accurate and technically comprehensive. Licensee personnel were knowledgeable and well prepared to address the issues.

The Engineering area is rated Category 1.

V. PLANT SUPPORT

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

Radiological controls were excellent in controlling radiation worker exposure and protecting the health and safety of the public. Controls were effective in limiting exposures well below regulatory limits and licensee target levels. While overall exposures during the outage were well below targets, there was one notable exception regarding exposure control.

Radioactive contamination controls were successful during major evolutions that had a high potential for spreading contamination. Management controls kept contaminated areas at a minimum. Radioactive

material control, postings, dosimetry use and dose tracking programs were all very effective.

The radiological effluent control program maintained doses to members of the public 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.

Chemistry programs functioned well with primary and secondary system chemistry parameters maintained below limits except during several condenser tube leak transients. Several personnel errors in the chemistry area, including miscommunications with Operations personnel during a condenser tube leak transient, indicated an area for improved attention.

In the Emergency Preparedness area, the licensee maintained a strong overall program that received good management support. Emergency response equipment and facilities were tested and maintained in a high state of readiness. Training exercises were effective with drill critiques providing valuable program feedback. Response to an emergency event was correctly and promptly classified and reported to off-site agencies. Independent audits were thorough and improved program effectiveness.

The fire protection program was strong with excellent overall performance. Fire protection equipment maintenance and operation was effective. Self-assessments and quality assurance audits of the program were thorough and adverse findings were quickly corrected. Housekeeping was excellent.

Improvements were noted in the physical security program. Management support was evident with heightened attention to security issues. Protected area detection and assessment aids, as well as access control equipment, was reliable and effective. Plant and security management was proactive in recognizing, analyzing and correcting potential problems. Implementation of audits and corrective actions were superior. The Physical Security Plan, training and qualification plans, and procedures were well written and effectively implemented.

The Plant Support area is rated Category 1.