ENCLOSURE

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

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Licenses: DPR-51
NPF-6

Licensee: Entergy Operations, Inc.
1448 S.R. 333
Russellville, Arkansas

Facility Name: Arkansas Nuclear One, Units 1 and 2

Inspection At: Russellville, Arkansas

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SUMMARY

ARKANSAS NUCLEAR ONE

INTEGRATED PERFORMANCE ASSESSMENT IN-OFFICE REVIEW RESULTS

OVERALL ASSESSMENT SCOPE AND OBJECTIVES

This Integrated Performance Assessment of both units of the Arkansas Nuclear One Station is being performed in accordance with NRC Inspection Procedure 93808, "Integrated Performance Assessment Process." The assessment is divided into an in-office review performed at NRC Region IV, an onsite assessment to validate the observations from the in-office review, and a final analysis of the results of the assessments and development of inspection recommendations. The assessment is being conducted by the Engineering branch of Region IV. The in-office review was performed during the weeks of February 26 through March 8, 1996. The onsite assessment is scheduled to be performed during the weeks of April 15 through April 26, 1996.

The assessment objectives are to develop an integrated perspective of licensee performance and arrive at recommendations for future inspection focus in the areas of safety assessment/corrective action, operations, engineering, maintenance, and plant support. The in-office review covers NRC inspection reports, licensee event reports, regional assessments, and licensee internal and external assessments. The results of the in-office review are included in this preliminary report. A pictorial representation is presented on the Preliminary Performance Assessment/Inspection Planning Tree in Attachment 2.

Following the issuance of this report, the team will validate its observations via a performance-based, onsite assessment. The results of the onsite assessment and in-office review will be used during the final analysis and development of inspection recommendations and will be documented in a final report to be issued after the conclusion of the onsite assessment. The final assessment report will include recommendations on where to focus future NRC inspection effort, and these recommendations will be depicted on a Final Performance Assessment/Inspection Planning Tree.

ASSESSMENT METHODOLOGY

During the in-office review, the team evaluated the Arkansas Nuclear One inspection record and performance history for a 2-year period spanning February 1994 to February 1996. Available licensee quality assurance audit reports and other self-assessment documents were reviewed. The review results were utilized to assign performance ratings of either decreased, normal, or increased inspection to the individual elements in each assessment area.

Where the team's review of inspection data and licensee information was inconclusive, or where sufficient information was not available to come to meaningful conclusions, individual elements were rated as being indeterminate.

Ratings for the overall performance in the areas of safety assessments/ corrective action, operations, engineering, maintenance, and plant support were not addressed during the in-office review phase.

The results obtained from the in-office review will be used by the assessment team to develop individual onsite assessment plans for each of the assessment areas. During the onsite review, the team will focus on those areas rated as indeterminate and those where the inspection or performance data record indicated potential performance weaknesses. The team will also validate the elements that were assigned decreased or normal inspection ratings. Following the onsite phase of assessment, the team will issue a final assessment report.

1 SAFETY ASSESSMENT/CORRECTIVE ACTION

1.1 Problem Identification

The licensee's programs for identifying equipment, human performance, and plant program deficiencies are the condition report process, the quality assurance audits, and both internal (departmental) self-assessments and nuclear safety and licensing (corporate) self-assessments. These programs, in general, were effective in identifying problems at the plant.

Based upon a review of the condition reports, the team determined that this process was effective for identifying significant issues. However, the team also noted that the licensee's threshold for identifying and entering problems into the condition reporting system was not consistent throughout the plant. For example, based upon the review of individual condition reports and radiation incident reports, the team noted that many issues were reported and that some of these reports involved very minor issues. Therefore, the team concluded that radiation protection personnel had a very low threshold for documenting problems. On the other hand, a review of the self-assessments found that maintenance and plant modification personnel were reluctant to document problems. As a result, it appeared that these personnel had a higher threshold for entering problems into the condition reporting system. In addition, a review of NRC inspection reports indicated that problem identification in the maintenance area was usually based upon self-disclosing events and that some problems were not identified in the engineering area (see Section 3.2).

The review of both internal and corporate self assessments indicated that these assessments were generally effective in identifying problems. The team noted that the internal self assessment of the radiation protection and emergency preparedness areas was especially effective in identifying problems.

In these areas, the self assessments identified problems that were considered to be low threshold (e.g., very minor radiological controls procedure violations that would typically not be identified as issues at other facilities). Although self assessments identified problems in the security area, they failed to identify one problem involving a failure to terminate a security badge.

The team found that the quality assurance audits were of good quality and of sufficient depth to identify both failures to comply with applicable requirements and areas for improvement in the licensee's programs. The team also noted that the scope of audits were appropriately expanded to address the generic aspects of issues. In addition, the team considered the licensee's practice of basing the scheduling of quality assurance audits on performance indicators and management direction to be effective toward enhancing problem identification. An exception to the quality assurance problem identification was noted in the operations area where the team noted that the audits appeared to lack depth. Specifically, the audit of condition reporting provided some statistical information regarding the number of condition reports per unit, but did not investigate operator perceptions and their use of the process. Additionally, an audit of plant operations reported differences between unit operations, but did not assess the impact or significance of those differences. However, the team noted that other independent assessment activities, including the plant safety committee and the safety review committee, effectively identified plant problems in these areas.

The team's preliminary recommendation is to maintain a normal NRC inspection effort in this area. The team will review the thresholds for entering problems into the condition report process, the relationship of lower tier reporting systems to the condition reporting process, and independent assessment activities.

1.2 Problem Analysis and Evaluation

The team reviewed NRC inspection reports, self assessments, and quality assurance audits and considered the performance in problem analysis and evaluation to be satisfactory. For example, the licensee event reports were comprehensive in their root-cause analyses and in the development of corrective actions. In addition, the site-wide corporate self assessment was comprehensive and provided an analysis of performance issues in several areas and a programmatic view of generic weaknesses. Although quality assurance audits were generally comprehensive, the team noted an example in the operations area where an audit involving the use of the corrective action process by operators was less probing than other audits. While this audit identified that condition reports were being written, it did not provide a view regarding the operators' perception and use of the process.

The team noted that the licensee rotated individuals from various site departments into the quality assurance group to enhance their knowledge of quality assurance activities and to strengthen the audit process. The team considered this rotation of personnel to be effective toward enhancing the effectiveness of quality assurance audits.

The licensee effectively used a condition review group and a corrective action review board to identify and review root causes and to identify corrective action plans to prevent recurrence. However, the team's review of self assessments indicated that formal root-cause analysis training of evaluators appeared to be lacking. Although some evaluators were trained, the licensee did not have a requirement to use only trained evaluators to perform root-cause analyses.

The team found the trending data base (C-SCAT) used by the licensee's assessment group to be effective. The licensee's assessment group reviewed these trends quarterly to determine if a problem was recurring. However, plant staff knowledge of the system's use to determine trends was lacking and it appeared that not all the plant staff had the necessary hardware to run these trends. The team also found that the equipment failure trending report was effective for determining recurring component failures, but that it was not clear how adverse trends were being resolved.

The safety review committee minutes demonstrated that their evaluations were extensive and complete. However, based upon the team's review of plant safety committee minutes, the evaluations performed by the plant safety committee appeared to be less extensive.

The team's preliminary recommendation is to maintain normal NRC inspection effort in this area. The team will assess the effectiveness of root-cause analyses, the effectiveness of the trending processes, and plant safety committee activities during the onsite inspection period.

1.3 Problem Resolution

The team considered the licensee's resolution of problems to be indeterminate because there was evidence of a lack of follow through on some issues. For example, the resolution of operator work-arounds and condition report corrective actions could not be determined from the documentation reviewed. Operator work-arounds refer to non-routine actions performed by operators to compensate for equipment not functioning as designed. A further example of this lack of follow through involved the quality assurance audit of fuel handling. The audit did not assess whether the pieces of tape used to position the refueling bridge were correct or were controlled. However, in the maintenance area, NRC inspection reports and licensee self assessments indicated that the problems were being resolved.

Through review of the licensee's safety review committee minutes, the team found that the self assessments in the engineering area were not as encompassing as in other areas. The engineering self assessments sometimes lacked the inclusion of the actions taken, or to be taken, to address an area for improvement. Also, the engineering self assessments generally did not provide goals on when these actions should be completed, and made incomplete conclusions.

The licensee generated component-failure analysis reports that compared the failure of component types at the licensee's plant with similar component types throughout the industry. The team noted that the component-failure analysis reports for 1995 indicated that little progress had been made in reducing the number of component types that continued to appear in these reports. The team noted six component types for Unit 1 and five component types for Unit 2, that had failure rates that were higher than the industry average. The team also noted that these component types continued to be reported for at least a year, which indicated that the issue was not being resolved in a timely manner.

The team's review of the self assessment for the operating experience process indicated that the handling of operating experience findings was effective. Site personnel were aware of operating experience information and provided this information in daily summary reports and at various plant meetings (e.g., condition review group meetings). In addition, the industry events analysis group established a computer database that was available to all site personnel. However, the team also noted that there appeared to be an excessive backlog of uncompleted evaluations with about 54 percent of open recommendations overdue. The team also noted that operating experience information was not formally included as a part of operator training.

The team's preliminary recommendation in this area is indeterminate. The team will review the timeliness of problem resolution, the handling of adverse trends, the status of unit specific component failures, and resolution of operating experience issue backlogs.

2 OPERATIONS

2.1 Safety Focus

The team determined that operations management and shift supervision made conservative operational decisions and displayed a conservative approach to the operation of both units, which demonstrated an overall good safety focus. There were several NRC inspection findings that demonstrated conservative operating decisions and operability determinations, comprehensive activity prebriefs, and appropriate shutdown risk consideration. The notable examples included the licensee's development of effective contingency actions for a leaking pressurizer safety relief valve on Unit 2; the planning and preparation for emergent switch yard work that thoroughly assessed work impact and off-site power supply operability; the performance of a thorough prejob brief for the integrated engineered safeguards test that exhibited appropriate risk consideration; and the licensee's reconfiguring of the electrical system distribution for plant loads to compensate for a vulnerability posed by an electrical storm.

A quality assurance audit of operations reported process and performance differences between Units 1 and 2 that suggested a different management approach toward the units. The quality assurance audit reported several administrative and operational differences between the units. Areas where differences were highlighted included guidance on room/area inspections, review requirements for boron concentration calculations, controls applied to

reduced inventory operations, and responsibilities and authorities of the assistant control room supervisor. Additionally, the audit reported as significant the difference in the number of management observations in each of the units. Specifically, Unit 2 operations management performed less than half (40 percent) as many observations as the Unit 1 operations management performed. Finally, the licensee compiled performance indicators and NRC inspection findings (examples in Section 2.3) for each of the units, which indicated a lower performance level for Unit 2.

The team's preliminary recommendation is to maintain a normal NRC inspection effort in this area. The team will perform additional assessment to better understand the impact of the process and performance differences between the units, and whether the differences are the result of different plant designs or different management approaches.

2.2 Problem Identification and Resolution

The team determined that operation's ability to identify problem areas through internal self-assessments and quality assurance audits was adequate. The licensee had completed only one self assessment related to operations during the current cycle involving a review of industry events analysis. The assessment was generally thorough and criticized cognizant organizations, including operations and operations training, for laxness in following through on the disposition of industry-events analysis review findings. However, quality assurance audits often appeared to lack depth or a questioning attitude. Examples of lack of depth included an audit of condition reporting that provided some statistical information regarding the number of condition reports per unit, but did not indicate that the operators were interviewed to assess their perceptions and use of the process. In addition, an audit of plant operations reported a number of differences in the way the units were operated from a management perspective, but did not assess the impact or significance of those differences. A lack of questioning attitude was exemplified in the audit of fuel handling. The audit reported operators using pieces of tape to position the bridge over the fuel upender (a device used to position fuel from a horizontal to vertical position) in the spent fuel pool transfer canal and suggested that the permanent markings be corrected, but the audit did not report having assessed whether the tape markers had been verified as correct or that they were being properly controlled. In addition, the team observed that the various quality assurance audit reports generally did not require follow-through on audit findings. The audits frequently provided recommendations, but did not require a response.

The team considered the licensee's problem resolution capability to be indeterminate. There were few findings related to problem resolution effectiveness and those were mixed. Examples of this mixed effectiveness from NRC inspection findings included the identification by Unit 2 operators of increasing activity levels on containment air monitors and a failure of these operators to follow through to identify the cause; conversely, when a design deficiency was identified while validating an abnormal operating procedure on the plant referenced simulator for Unit 2, the resolution of the design

deficiency was characterized as aggressive. As previously noted, the licensee's self-assessments and quality assurance audits generally reported or exhibited a lack of follow through, which the team tentatively assessed as indicative of weak problem resolution.

The team's preliminary recommendation is to maintain a normal NRC inspection effort in the area of problem identification. The team's preliminary recommendation in the problem resolution area was indeterminate. The team will perform further assessment to determine audit and self-assessment finding prioritization, tracking, and resolution; the nature of current operator work-arounds; and self-assessment capability.

2.3 Quality of Operations

The team determined that the quality of operations was generally good; however, there were some notable exceptions. NRC inspection reports noted consistently strong performance in the command, control, and communication disciplines in all facets of operation and training. The operators responded well to abnormal and emergency events, which included multiple reactor trips over the past year, a transient precipitated by the electrical grid, and an abnormal event caused by a severe electrical storm. However, several operational performance errors occurred during steady state conditions, in outages, and while transitioning into and out of outages. While many of these errors had aspects of procedural deficiencies or improper procedure use, most of the errors could have been avoided through proper self-checking or expected skill-of-the-craft. Examples included the failure of Unit 2 operators to open the reactor head vents during reactor coolant system drain down; the failure of Unit 1 operators to establish the proper water level in the fuel transfer canal which resulted in higher than planned exposures; poor configuration control resulting in de-energization of the control room recirculation fan; improper alignment by Unit 2 operators of the high pressure safety injection swing pump following a maintenance activity; Unit 2 operator inattention resulting in a reactor trip; extensive radiological contamination of the service air system resulting from unapproved system operation; and, introduction of foreign material into the Unit 2 reactor vessel when improper bridge operation damaged the hoist camera. The team determined that these findings represented a lower level of performance in the operation of Unit 2 compared to that of Unit 1.

The team noted from NRC inspection reports that operations training was consistently strong during this cycle. High examination pass rates were achieved. The reports regularly noted management presence and participation in training evaluations, which the team interpreted as evidence of strong management involvement. The reports consistently cited strong command, control, and communication discipline.

The team's preliminary recommendation is to maintain a normal NRC inspection effort in this area. Additional team assessment is required in the area of intradepartmental communication, oversight and control of maintenance and engineering activities, and control of clearances and equipment out of service.

2.4 Programs and Procedures

The team determined that the quality and effectiveness of operations programs and procedures was indeterminate. This determination was largely based on a lack of information regarding programs and processes for procedure review and revision, and industry event review and feedback of lessons learned. While several procedural deficiencies are described below, the team concluded that these deficiencies were primarily contributors to events rather than the root cause and did not create a significant safety concern overall.

The licensee identified that deficiencies in procedures used during normal operation contributed to operator errors, operational events and procedure violations. Examples of operational errors to which procedural deficiencies contributed included the failure to open the reactor vessel head vent valves while draining the reactor coolant system to reduced inventory, the failure to maintain the axial shaping index that led to a reactor trip, the failure to classify temporary hoses attached to the service water drains on the Unit 2 shutdown cooling heat exchangers as a temporary modification, the unexpected de-energizing of a control room recirculation fan, and equipment damage due to waterhammer. As previously noted in Section 2.3 of this report, the team determined that self-checking and skill-of-the-craft should have compensated for most of these procedural deficiencies.

Quality assurance auditors and plant operators identified procedural discrepancies as a result of system alignment verifications and routine operator rounds. The two quality assurance surveillances performed during the current cycle to verify system line-ups each identified procedural discrepancies. The discrepancies were of the type which should have been detected through the verification and validation process for procedure development and revision. Similarly, procedural discrepancies related to system lineup and configuration control (as further discussed below) were identified as a result of a system walkdown by a plant operator.

NRC inspections reported that each unit experienced transients leading to a reactor trip, which required implementation of the emergency operating procedures. Only one discrepancy in the emergency operating procedures was noted as a result of their use in response to events. The licensee identified a discrepancy in the Unit 2 emergency operating procedures regarding sufficient shutdown margin following a reactor trip near the end of a fuel cycle. Licensee engineering determined that the shutdown margin required by technical specifications could not be maintained with control rods alone following a reactor trip late in core life with any significant cooldown of the reactor coolant system. The emergency operating procedures did not contain compensatory actions for this plant condition.

The team determined from NRC inspection reports and licensee quality assurance audits that equipment lineup and valve status programs have been adequate. Among several valve lineup verifications, only one verification identified any configuration control discrepancies. Several valves, which had recently been

added to the locked valve procedure, were found shut but not locked. As previously noted, procedural discrepancies were identified subsequent to this discovery. The valve locking error was caused, in part, when all procedures relating to these valves were not revised to reflect the locked requirement.

A licensee self assessment identified deficiencies in the program for operating experience review and feedback of lessons learned. The self assessment stated that the number of backlogged evaluations (64) and the percent of overdue recommendations (54 percent) was excessive. The assessment also reported poor prioritization of action items and a lack of commitment to close items.

The team's preliminary recommendation in this area is indeterminate. Further team assessment is required in the areas of procedure review and revision, and disposition of industry events and lessons learned.

3 ENGINEERING

3.1 Safety Focus

The team determined that engineering management and staff had established and demonstrated a good safety perspective. NRC inspection reports and engineering self assessments documented observations that engineering provided good support to the day-to-day operations of the plant. However, an engineering self assessment noted that system engineering could be more proactive. The self assessment attributed this posture to a system engineering workload that restricted in-plant time. To reduce this workload, the licensee formed a minor modifications group within design engineering which took over the responsibilities for minor modifications from system engineering, thus, allowing system engineers more time to focus on plant safety issues.

NRC inspection reports documented that operability evaluations were conservative. Examples included the pressure locking susceptibility of the containment sump gate valves and the lack of welds on the Unit 1 reactor building coolers. However, the plant safety committee discovered problems with a safety evaluation performed for a procedure change to provide instructions for draining service water from the shutdown cooling heat exchangers with temporary hoses and pumps. Specifically, the operability evaluation did not clearly define the plant operating modes when the draining would be allowed, and did not properly address the actions to take if flooding occurred during the draining process.

The team's preliminary recommendation is to maintain a normal NRC inspection effort in this area. The team will examine the effects of the licensee's efforts to reduce system engineering workload, and to achieve a better balance between proactive and reactive work; review operability and safety evaluations performed by engineering; determine the adequacy of communications between design and system engineering; and determine whether management's expectations are being communicated to the engineering staff.

3.2 Problem Identification and Resolution

The team considered engineering's ability to identify problem areas to be adequate. Based upon a review of plant condition reports, the team noted that engineering related deficiencies were being identified. However, it was not clear whether engineering personnel were proactive in identifying problems.

An engineering self assessment concluded that engineering was effectively utilizing industry information to assist in problem identification. An example was the identification of the potential for pressure locking of the containment sump valves, as described in an NRC information notice. However, there was one example identified in an NRC inspection report where a problem was not identified. This example involved the failure of engineering to utilize industry information to identify a potential plant problem involving the effect of environmental conditions on the lift points of the main steam safety valves. An engineering self assessment also identified that system engineers had more responsibilities than those at other plants which restricted their in-plant time and prevented the system engineers from being more proactive in identifying plant problems. An NRC inspection report documented an example to the contrary by noting that system engineering was proactive with respect to the reliability monitoring of the emergency feedwater pump turbines in that they were tracking success-on-demand (including surveillance test results), instead of just total availability as was being done in other plants.

In general, engineering thoroughly evaluated identified issues and provided adequate technical support for resolution. NRC inspection reports documented the following examples of good problem resolution practices: system engineers provided good day-to-day support to the plant in resolving emergent issues, such as, the resolution of the Unit 1 contamination of the service air system; design engineering resolved problems, such as, the inappropriate testing methodology to detect Unit 1 service water valve seat leakage; and, engineering's proposed corrective actions regarding the failure to specify environmental conditions for the testing of main steam safety valves were thorough and comprehensive. A licensee event report documented that engineering participated in the identification and resolution of a Unit 2 design deficiency where a single failure of a direct current electrical bus could affect both trains of the emergency feedwater system.

The licensee effectively resolved an engineering self-assessment finding regarding the increased system engineering workload. The team noted that the licensee removed the responsibilities for performing minor modifications from system engineering and placed it in the newly formed minor modifications group under design engineering.

Through review of the safety review committee minutes, the team found that the licensee considered that self assessments were not as encompassing in the engineering area as in other areas. The team reviewed the engineering self assessments and found that the self assessments sometimes lacked the inclusion

of the actions taken, or to be taken, to address an area for improvement. Also, the engineering self assessments did not generally provide goals on when these actions should be completed, and made conclusions without providing the supporting data.

The team's preliminary recommendation is to maintain a normal NRC inspection effort in both the problem identification and resolution areas. The team will examine the effects of the licensee's efforts to reduce system engineering workload and improve the self-assessment process, and the licensee's responsiveness to self-assessment findings.

3.3 Quality of Engineering Work

The overall quality of engineering work was good. NRC inspection reports documented that operability evaluations, engineering evaluations, and calculations were thorough and conservative. However, an NRC engineering team inspection found the following exceptions: breaker sizing calculations for motor-operated valves were performed in a nonconservative manner; engineering evaluations performed by system engineering were weak in several plant engineering assistance requests; maintenance engineering did not provide clear and concise responses to maintenance engineering requests; design engineering provided an inadequate response to an engineering assistance request concerning the minimum required volume in the refueling water tank; and minor errors, nonconservative assumptions, and a lack of rigor were identified in some engineering calculations.

The NRC inspection reports and engineering self assessments documented that engineering communications with operations and maintenance was good. However, a self assessment found that communications between design and system engineering was sometimes lacking as evidenced by overlapping work in the modification process. In addition, an engineering self assessment identified that temporary modifications were sometimes used in lieu of permanent modifications.

The team's preliminary recommendation is to maintain a normal NRC inspection effort in this area. The team will review the implementation of selected plant permanent and temporary modifications.

3.4 Programs and Procedures

The team considered engineering's ability to effectively implement programs and procedures to be adequate. An NRC inspection report documented that engineering had a proactive performance monitoring program by trending success-on-demand for comparison with the reliability estimates used in the probability risk analysis for the turbine-driven auxiliary feedwater pumps. NRC inspection reports documented that design changes were generally performed in accordance with approved procedures. However, an NRC inspection report documented an example where procedures were not followed when a condition report was not written to identify the potential for pressure locking of the containment sump valves.

The implementation of the temporary modification program was considered to be a concern by the team. NRC inspection reports documented the following: the connection of hoses and a pump to a shutdown cooling heat exchanger without using the temporary modification process; the improper placement of caution tags resulted in the loss of power to a control room recirculation fan; and, a temporary modification did not address that a control room alarm would be lit. In addition, an engineering self assessment found that some temporary modifications were used in lieu of permanent modifications.

An NRC inspection report identified a concern in the licensee's motor-operated valve program. Specifically, engineering incorrectly assumed that a valve was not susceptible to pressure locking or thermal binding if it had successfully operated at conditions that were conducive to pressure locking or thermal binding.

The team's preliminary recommendation is to maintain a normal NRC inspection effort in this area. The team will review the implementation of the temporary modification program.

4 MAINTENANCE

4.1 Safety Focus

The team concluded that maintenance's safety focus was good. There was evidence in NRC inspection reports of good safety focus during prejob briefings and of management's involvement in the oversight of work activities and decision making. A review of quality assurance audits and surveillances also provided evidence that the safety focus in the area of maintenance was very good.

A review of NRC inspection reports indicated that the safety focus on maintenance management's communication of expectations has been mixed. While management expected personnel to follow procedures, the team found an example where a maintenance supervisor directed maintenance personnel to deviate from a deficient procedure in lieu of following the temporary change process procedure for correcting such a condition. On the other hand, the team found an example in which licensee management communicated an effective safety focus regarding switchyard maintenance. This communication included consideration of the impact of the maintenance activities on plant operations and the availability of startup transformers and the emergency diesel generators for both units.

The team's preliminary recommendation in this area is indeterminate because there was insufficient documentation to support an overall conclusion. Further team assessment is required to determine how work activity priorities are set, including the consideration of shutdown risk and outage planning; communication of management expectations; management involvement in oversight and decision making; and, the coordination of maintenance department activities with other departments.

4.2 Problem Identification and Resolution

The team concluded that maintenance's process for identification of problems was adequate. The team reviewed four self assessments, three quality assurance surveillances, and three quality assurance audits that were performed in the maintenance area. The team found that the scope of the quality assurance audits and surveillances was thorough. The team also noted that the self assessments were performed at management's request after a problem had occurred. The team considered this to be a proactive approach that contributed to determining the extent of the identified problems.

Contrarily, the team also concluded that the licensee's process for identifying of problems through maintenance department self assessments was somewhat reactive in that the problems were usually self disclosing. However, the team also noted that quality assurance audits and surveillances were identifying problems that were not self disclosing.

A review of NRC inspection reports, and licensee self-assessments and quality assurance audits and surveillances, indicated that maintenance was effective in resolving maintenance problems. The team also noted that, while the quality assurance audits required written response for some of the recommendations provided in the reports, only one recommendation in the quality assurance surveillances required a response. Since the self-assessments did not require a response from the maintenance organization, the team could not evaluate the effectiveness of the licensee's problem resolution performance.

The team determined that the backlog of maintenance items was not excessive and was well managed for both units. The team also considered the size of the backlogs to be a further indication of effective problem resolution.

The team's preliminary recommendation in this area is to maintain normal NRC inspection effort in both the problem identification and resolution areas. Additional team assessment is required in the areas of self assessments, problem identification, root-cause analyses, trending, and licensee responsiveness to assessment findings.

4.3 Equipment Performance/Material Condition

NRC inspection reports, quality assurance audits and surveillances, and self assessments indicated that the plant material condition was very good. However, the team also found that the licensee's performance indicator reports and NRC inspection reports indicated that the equipment performance was mixed. The team noted that both units experienced several power reductions to identify and repair leaking condenser tubes and also experienced a plant trip when misaligned breaker contacts caused a reactor trip. In contrast, the team found that safety system performance for both units exceeded the goals established by the licensee.

The team found that one method maintenance used to measure equipment performance was through component failure analysis reports. The team noted that component failure analysis reports identified six component types for Unit 1 (i.e., heat exchangers, pumps, transmitters, motors, inverters, and

emergency diesel generator engines), and five component types for Unit 2 (i.e., accumulators, heat exchangers, valves, transmitters, and circuit breakers) that had failure rates higher than the industry norms for similar component types. Each of these component types had been on the reports for the past year, which the team considered to be an indication of equipment performance degradation.

The team's preliminary recommendation in this area is to maintain normal NRC inspection effort in this area. Additional team assessment is required in the areas of material condition, component failure analysis, pump and valve performance, electrical system performance, and system status.

4.4 Quality of Maintenance Work

The team concluded that the quality of maintenance work was good. The NRC inspection reports identified several performance errors that were of low safety concern. Examples included the signing of a temporary modification sheet for independent verification by an unqualified apprentice electrician; the failure of technicians to rinse the sensor for a chlorine monitor during a surveillance; incorrect installation of thrust bearings for a Unit 1 reactor building cooling fan; and, the failure of a welder to verify interpass temperature prior to making a subsequent weld pass.

The team reviewed a listing of approximately 10,000 work documents that had been completed over the previous 2 years. While this review provided an indication of the licensee's work process, the team could not determine the safety classification of the work documents, nor readily determine the extent of rework activities.

The team noted that NRC inspection reports and a quality assurance surveillance documented that foreign material control was satisfactory. However, there was one instance identified where personnel error caused the introduction of foreign material into the Unit 2 reactor vessel.

The team also noted, during review of NRC inspection reports, that good interdepartmental and intradepartmental communications were occurring. The team considered the good communications to have contributed to the good performance of maintenance activities.

The team's preliminary recommendation is to maintain a normal NRC inspection effort in this area. Additional team assessment is required in the areas of foreign material exclusion, control of maintenance and test equipment, control of work activities, and a review of rework activities.

4.5 Programs and Procedures

The team concluded that the maintenance programs were generally well developed. In addition, the team concluded that the maintenance procedures were generally well written and followed appropriately by maintenance personnel. However, this review also identified examples of less than adequate procedures. These examples included a procedure for troubleshooting the chlorine monitor that did not contain correct information to perform the

task; a procedure to replace a motor bearing that did not provide adequate instructions; and, a job order that did not contain adequate instructions to require a mechanic to wear a protective suit during replacement of a leaking gasket on a caustic system. In addition, as discussed in Section 4.1 of this report, a maintenance supervisor exhibited poor procedure adherence when he gave improvised directions to technicians to compensate for procedural deficiencies rather than following the requirements for temporary procedure changes.

The team's preliminary recommendation is to maintain a normal NRC inspection effort in this area. Additional team assessment is required in the areas of preventive and corrective maintenance, in risk insights as applied to maintenance activities, and to monitor procedure adherence activities.

5 PLANT SUPPORT

5.1 Safety Focus

Radiation Protection

The team concluded that licensee management focused appropriate attention in significant areas such as the ALARA program and source-term reduction program. This resulted in a declining trend in personnel radiation exposure, radioactive waste volume, and low incidents of internal exposures. However, the team also noted that management was not successful in focusing on areas of lesser significance such as contamination and radioactive material control. This was evidenced by the elevated number of radioactive material/ contamination control problems and poor work practices documented in the radiological information reporting system, and the large number of personnel contamination events (663) documented in 1995.

The team's preliminary recommendation is to maintain a normal NRC inspection effort in this area. The team will review the frequency, duration, and effectiveness of management observations and oversight of radioactive material/contamination controls and worker practices.

Security

The team concluded that licensee management continued to provide strong support to the physical security, access authorization, and fitness-for-duty programs. However, NRC inspection reports and quality assurance audits indicated that significant nonconformances were identified. NRC inspection reports and quality assurance audits indicated that the licensee employs a dedicated, professional, and knowledgeable staff. Licensee interviews documented in a quality assurance audit with all levels of the site organization indicated that management expectations for performance had been clearly communicated, and intradepartment communications had been enhanced by "plan-of-the-day" meetings. The team also noted that quality assurance surveillances were requested when weaknesses were identified in the areas of fitness-for-duty and access authorization.

NRC inspection reports also identified weaknesses in the access authorization area involving the improper granting of unescorted access, the failure to identify a criminal record, the failure to make a report to the NRC, and the failure to withdraw temporary unescorted access for an individual after receiving adverse reliability information from outside sources. It appeared that poor coordination and communications between site physical security and the corporate access authorization organizations contributed to these issues.

The team's preliminary recommendation is to maintain a normal NRC inspection effort in this area. The team will review communications between the site and the corporate office.

Emergency Preparedness

The team concluded that management's oversight of emergency preparedness activities and involvement in decision making were very good. A quality assurance audit and NRC inspection report identified that the emergency preparedness program received good support from trained and qualified personnel. NRC inspection reports also documented very good coordination and communication with other departments during emergency preparedness exercises (drill and simulator scenario) and that the emergency preparedness facilities were maintained in a state of readiness.

The team's preliminary recommendation is to maintain a normal NRC inspection effort in this area. The core inspection effort has yet to be performed in this functional area. However, a review of inspection effort from the last assessment period indicated an adequate scope and focus to permit a meaningful assessment of licensee performance. In the upcoming inspections, the team recommends that emphasis be placed on the emergency preparedness organization and the readiness of the emergency response facilities.

5.2 Problem Identification and Resolution

Radiation Protection

The team concluded that quality assurance and self-assessment oversight of the radiological controls organization have been excellent. The radiation protection department self assessment was effective in identifying areas for improvement, such as, radioactive material and source control, radiological postings, high radiation area control, and contamination controls. The radiological information report system provided useful data for the evaluation of trends (e.g., radioactive material and contamination controls). The team considered that the licensee's practice of rotating personnel from the radiation protection department to the quality assurance department, as identified in an NRC inspection report, to be an enhancement toward the station's ability to identify problems. Although NRC inspection reports documented an aggressive attitude toward resolving identified deficiencies (e.g., assignment of responsibility for evaluation or problem resolution), the radiological information reports and quality assurance audits reviewed by the team did not contain details of corrective actions or the effectiveness of corrective actions.

The team's preliminary recommendation in both the problem identification and resolution areas is indeterminate. The team will review the adequacy of corrective actions initiated to address radiological information reports and quality assurance audit findings.

Security

The team concluded that the security organization's use of condition reports, quality assurance audits, and self assessments for problem identification was generally good. Condition reports were useful for tracking, trending, and assigning responsibility for corrective actions; audits were comprehensive and included critical comparisons to regulatory requirements; and, audit teams were composed of members that had wide industry experience. However, the team also noted that the security and quality assurance organizations did not audit the portion of the security program involving the termination of security badges. The team was concerned that such an audit could have identified deficiencies within the access control program that involved the failure to control access for a contract employee that had been terminated for cause.

The team's review of corrective actions documented in condition reports indicated that weaknesses were resolved in a timely manner. The team also noted that the NRC inspection reports indicated that problems were being properly resolved. However, the resolution of problems identified in quality assurance surveillances performed to evaluate weaknesses in the areas of access authorization and fitness-for-duty was not apparent.

The team's preliminary recommendation is to maintain a normal NRC inspection effort in both the problem identification and resolution areas. The team will review security organization use of the security reporting log, condition reports for problem identification and resolution, and the resolution of problems identified in the quality assurance surveillances.

Emergency Preparedness

The team concluded that emergency preparedness audits and self assessments were comprehensive. Quality assurance audits and self assessments included critical comparisons to regulatory standards, observations during emergency planning exercises, and general program reviews. The emergency preparedness organization has effectively used an internal documentation and tracking system to track improvement items and drill findings. They have also used condition reports to document and track action on quality assurance audit and surveillance findings. The team concluded that self assessments have been effective in identifying problems.

NRC inspection reports also indicated that the emergency preparedness organization used condition reports to document and track action on quality assurance audit and surveillance findings and performed root-cause analyses on all significant condition reports. Overall, the team determined that self assessments had been effective in resolving and preventing problems.

The team's preliminary recommendation is to maintain a normal NRC inspection effort in both the problem identification and resolution areas. The core inspection effort has yet to be performed in this functional area. However, a review of inspection effort from the last assessment period indicated an adequate scope and focus to permit a meaningful assessment of licensee performance. In upcoming inspections, it is recommended that emphasis be placed on corrective actions developed in response to drill critiques, condition reports, and quality assurance audits.

5.3 Quality of Plant Support

Radiological Controls

The team concluded that the licensee has implemented sound and effective radiological control practices. NRC inspection reports have noted effective and highly visible ALARA practices resulting in significant reduction in radiological source term and person-rem exposures. The licensee's 1995 quality assurance audit noted that the radiation protection program implementation was satisfactory when evaluated against NRC regulations and plant technical specifications. NRC inspection reports have noted very good prejob briefings and good training provided in the areas of general employee training, radiation worker training (including access controls for high radiation areas), and radioactive waste and effluent management.

An NRC inspection, however, identified weaknesses with the implementation of radiological controls for the installation of the core support assembly during the Unit 1 refueling outage. These weaknesses included communications between work groups, procedures which did not incorporate radiation dose reduction techniques, and failures to comply with radiation work permit requirements. In addition, a quality assurance audit and the radiological information reporting system have continued to identify radioactive material and contamination controls, radiological postings, and worker practices as areas for improvement.

The team's preliminary recommendation is to maintain a normal NRC inspection effort in this area. The team will focus on radiological postings, contamination and radioactive material controls, worker practices, and radiological planning and oversight of work.

Security

The team concluded that the licensee was properly implementing the security plan. Although, the licensee properly implemented access authorization and fitness-for-duty, the NRC identified significant nonconformances in the access authorization area. NRC inspection reports documented that the licensee's security practices included verifications of the integrity of protected area barriers, maintenance of isolation zones around these barriers, and protected area personnel access measures. Based on interviews and a review of representative records, a quality assurance audit indicated that fitness-for-duty, along with the related role of access authorization, was in compliance with regulatory requirements.

The team noted that the significant nonconformances identified in the NRC inspection reports in the access authorization area involved the improper granting of unescorted access, the failure to identify a criminal record, the failure to make a report to the NRC, and the failure to withdraw temporary unescorted access for an individual after receiving adverse reliability information from outside sources. Poor coordination and communications between site physical security and the corporate access authorization organizations contributed to these issues.

The team's preliminary recommendation is to maintain a normal NRC inspection effort in this area. The team will review the corrective actions implemented to address identified weaknesses in the access authorization practices, communications between the site and the corporate office, and vehicle access controls.

Emergency Preparedness

The team concluded that the emergency response facilities were adequate and maintained in a proper state of readiness. NRC inspection reports indicated that an appropriate number of emergency response personnel had been trained and qualified to respond in the event of an emergency. Emergency preparedness exercise scenarios have been sufficient to demonstrate emergency response capabilities. During the last exercise and simulator scenario walkthroughs, the licensee staff rapidly recognized, classified, and effectively mitigated the events in the exercise and formulated proactive contingency plans. Communications between, and briefings within, the operations support center, technical support center, and control room were effective. Also, the State of Arkansas was kept continuously abreast of changing plant conditions. Identified weaknesses included radiological planning, briefing, and radio communications with emergency response teams; and a less than timely notification of state and local authorities following the declaration of an emergency exercise Alert.

The team's preliminary recommendation is to maintain a normal NRC inspection effort in this area. The core inspection effort has yet to be performed in this functional area. However, a review of inspection effort from the last assessment period indicated an adequate scope and focus to permit a meaningful assessment of licensee performance. In upcoming inspections, it is recommended that emphasis be placed on emergency preparedness training and organizational readiness.

5.4 Programs and Procedures

Radiation Protection

The team concluded that the radiological control program has been good. Although the quality assurance audits indicated that the technical content and clarity of procedures was good, there were some exceptions. These exceptions included minor problems with consistency between health physics procedures, human factors, and referencing of commitments within procedures.

The team's preliminary recommendation is to maintain a normal NRC inspection effort in this area. The team will review procedure quality, usage, and methods used for revising procedures.

Security

The team concluded that security programs and procedures were very good. NRC inspection reports and quality assurance audits indicated that procedural guidance was clear, and procedures were being followed. An NRC inspection report documented a weakness in a recent proposed change to the industrial security plan. Portions of this change were inconsistent with provisions of Generic Letter 93-07 and an amendment to the facility operating license, in that requirements for maintaining security procedures were removed from Technical Specifications and were not incorporated into the security plan.

The team's preliminary recommendation is to maintain a normal NRC inspection effort in this area. The team will review methods used for revising procedures and the security plan.

Emergency Preparedness

The team concluded that changes to the emergency plan and implementing procedures have been properly reviewed, approved, and maintained. NRC inspection reports indicated that the emergency preparedness organization had maintained current controlled copies of the emergency plan, emergency plan implementing procedures, and emergency telephone directories in the emergency response facilities. The team also concluded that the licensee demonstrated very good use of procedures during emergency preparedness exercises. An NRC inspection report and licensee exercise critiques identified several weaknesses which included unclear search and rescue procedures and insufficient guidance provided in a core damage assessment procedure.

The team's preliminary recommendation is to maintain a normal NRC inspection effort in this area. The core inspection effort has yet to be performed in this functional area. However, a review of inspection effort from the last assessment period indicated an adequate scope and focus to permit a meaningful assessment of licensee performance. In upcoming inspections, it is recommended that emphasis be placed on procedure usage.

ATTACHMENT 1

Documents and Information Reviewed In-Office

GENERAL

- NRC inspection reports for the current assessment period
- Licensee event reports for 1994 and 1995
- Site organization charts
- Performance indicators
- Listing of all the daily/weekly meetings that occur onsite

PROCEDURES

- Index of procedures

- Procedures for the conduct of:

  Operations
  Maintenance
  Engineering
  Radiation Protection
  Security

- Work control procedure

- Operability evaluation procedure

- Reportability evaluation procedure

- Modification procedures (permanent, minor and temporary)

- Root cause evaluation procedure

OPERATIONS

- List of standing orders
- Post trip review reports
- Night orders
- Directives on place keeping, peer and self-checking
- List of operator work-arounds

MAINTENANCE

- Equipment performance reports
- List of job orders
- List of open job orders
- Risk desk guide

ENGINEERING

- List of open engineering requests

- List of both temporary and permanent modifications implemented
- List of modifications cancelled
- List of open approved modifications
- List of operability evaluations
- List of reportability evaluations
- List of root causes

SELF-ASSESSMENT/CORRECTIVE ACTION

- Selected self-assessments
- List of self-assessments
- Plant safety committee minutes
- List of quality assurance audits
- Copy of most recent quality assurance audits
- Safety review committee minutes
- Safety review committee charter
- Plant safety committee procedure
- List of condition reports
- List of open condition reports

ARKANSAS NUCLEAR ONE

PRELIMINARY PERFORMANCE ASSESSMENT/INSPECTION PLANNING TREE