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Enclosure

TABLE OF CONTENTS

EXECUTIVE SUMMARY

The NRC integrated assessment team led by the Special Inspection Branch of the Office of Nuclear Reactor Regulation (NRR), with support from other branches in NRR and Region IV, completed a two week Inspection at WNP-2 on August 17, 1995. The team, using Inspection Procedure 40500, assessed the licensee's programs to identify issues, perform root cause analyses and implement corrective actions. It evaluated the results of licensee efforts to effect improvement in these areas over the past six months, with specific attention given to human performance. The inspection focus was on the areas of maintenance and engineering. The team examined self-assessment and quality assurance programs designed to identify and resolve problems through the corrective action program.

The team concluded that the licensee's site-wide problem identification process through Problem Evaluation Requests (PERs) was comprehensive and continued to gain acceptance by site personnel. However, the team learned of instances where first-line maintenance supervisors discouraged the initiation of PERs by the craft personnel. In the engineering department, the staff did not understand the requirements and threshold for initiating PERs, causing a significant delay in issuing a PER on the defective vacuum breaker snubbers.

Recent licensee actions to improve the PER process include the review of all completed PERs by the quality assurance group and the Corrective Action Review Board's review of all "significant" PERs. The effectiveness of these programs have not been demonstrated at the time of the inspection.

Licensee initiatives to improve the corrective action program and root cause analysis process, to address recurring problems, to broaden the scope of resolutions, and to effect employee cooperation had not been measurably successful. During the mid-cycle self-assessment in February 1995, the licensee had identified human performance problems as an important contributor to unexpected events. The team verified that such problems had continued to occur during the six months before the inspection. For example, performance-related mistakes caused a feedwater transient, a turbine-generator trip, and another feedwater transient that came close to becoming a reactor trip and also presented an unnecessary challenge to the control room crew. In the health physics area, the same high-high area radiation door was left unlocked and unattended twice in three months.

In the quality assurance area, recent audits identified human performance problems, but audit recommendations did not provide adequate information to resolve the underlying issues, nor did they appear to be binding on the staff. In addition, there were weaknesses in the followup of recommendations.

In the maintenance area, the team assessed the recently implemented work control process. The work control process had undergone considerable change since the maintenance area had been reorganized under separate managers for shop performance and work control. Backlogs in both preventive and corrective maintenance are well managed. The team identified a potential weakness in engineering support of maintenance activities.

In the engineering area, the team identified weaknesses with a trouble shooting effort that did not properly characterize a feedwater problem. Coupled with poor communications between the engineering and operations departments, a feedwater transient resulted.

1.0 INTRODUCTION

Early in the current SALP (systematic assessment of licensee performance) cycle, NRC inspection reports, licensee self-assessments, and third-party evaluations identified significant weaknesses in the licensee's corrective action program, including weaknesses in problem identification, root cause analysis, and corrective action implementation. Personnel errors appeared to be an important contributor to plant events during this period. In response to those findings,the licensee initiated improvements to address corrective action-related issues including human performance.

The NRC assessed the effectiveness of the licensee's enhancements with emphasis on the past 6 months. The inspection team evaluated human performance issues, primarily in the areas of engineering and maintenance.

This inspection was conducted in accordance with NRC Inspection Procedure IP 40500, "Effectiveness of Licensee Controls in Identifying, Resolving, and Preventing Problems." In preparation for the inspection, the team reviewed inspection reports and licensee quality assurance audits and self-assessments conducted over the last 6 months.

The team has characterized its findings as deficiencies and observations. Deficiencies are the apparent failure of the licensee (1) to comply with a requirement or (2) to satisfy a written commitment to conform to the provisions of applicable codes, standards, guides, or other accepted industry practices that have not been made legally binding requirements. Observations are findings that could lead to violations but have no direct regulatory basis. A deficiency and observations are listed in Appendix A.

2.0 CORRECTIVE ACTION PROGRAMS

2.1 Problem Evaluation Request

The problem evaluation request (PER) is a site-wide mechanism available to all personnel for identifying problems. The process was described in Procedure 1.3.12, Revision 20, "Problem Evaluation Request," and Procedure 1.3.12.A, Revision 2, "Processing of Problem Evaluation Requests (PER)."

The team assessed the acceptability and use of the process by site personnel. As of the end of July 1995, site personnel had initiated approximately 900 PERs in 1995 and 2200 PERs in the past 12 months. The licensee evaluated each PER to determine its significance. A significant PER was defined as one that addresses an event that resulted from equipment failure, program failure, or inappropriate personnel action that might affect safe plant operations. The team noted that the screening guide and the definition for determining the significance of PERs were not part of a procedure and were informally implemented. The team identified this weakness in the licensee's PER program as Observation 95-201-01.

The team concentrated its detailed review on PERs initiated during the 8 months before the inspection. These included PERs pending disposition, PERs on hold, and completed PERs. In addition, it focused its review on the PERs designated as "significant" by the licensee.

2.1.1 Initiation of PERs

The team interviewed personnel and examined recently issued PERs to determine if the employees accepted the process and if PERs were generated expeditiously. The team found some indications that the maintenance, engineering, and operations departments were sometimes reluctant to initiate PERs. For example, during interviews employees expressed the following concerns:

- Getting a concern into the system took extensive effort because of the strict format required.
- Initiating a PER was a supervisor's job, and employees would only do it when told to.
- Employee concerns would not be considered if the supervisor did not agree that a problem existed.
- Some employees believed that being told to initiate a PER was a form of punitive action when supervisors or management believed that an individual had committed an error.

The following examples of the licensee's resistance to write PERs and have them issued within the 24-hour time constraint set by the procedure were identified:

- PER 295-0925 was initiated when a torque head used to torque flange fasteners for a main steam relief valve could not be located for post-use calibration. The discovery date was July 19, 1995. The originator had signed the PER on July 31, 1995, but the shift manager had not signed the PER until August 8, 1995. This indicated that a condition with potential safety implications had not been entered into the corrective action system until 20 days after it was discovered. The licensee subsequently conducted a visual inspection of all affected relief valves. No leaks were identified.
- The licensee's Quality Assurance (QA) Surveillance 294-003 showed that a PER had not been initiated as required when a component failure resulted in the inability to complete a technical specification (TS) surveillance. The operations staff had stated that it did not believe a PER was necessary because the component was not considered to be operable at the time of discovery.
- During the last outage, a system engineer had initiated the replacement of three snubbers because of concerns that included noise emanating from the snubber and erratic movement. Subsequently, the snubbers were examined (about the week of July 17, 1995), and two of the snubbers were

found to be degraded and were shipped to a testing laboratory. The PER related to this issue, PER 295-0922, was not written until August 7, 1995. The discovery date noted on the PER for the problem did not specify the observation during the outage. In response to the team's concerns the licensee initiated a PER to determine the cause for the delay in initiating PERs.

Isolated resistance to using the PER process and the occasional failure to issue PERs within time constraints were identified as Observation 95-201-02.

2.1.2 Root Cause Analysis

The team evaluated the following nine significant PERs in regard to root cause analysis: PERs 294-0197, 294-0331, 294-0733, 294-0741, 294-0767, 294-0798, 294-0799, 294-0814, and 294-0843. The team determined that root cause analyses were performed for eight of the nine PERs and that probable root causes were identified. PER 294-0814, however, did not identify a root cause for an incorrectly placed tag for a clearance order. The PER stated that the cause was "not known" and that recommended corrective actions would be "determined when the cause of the tagging error is determined." However, no followup was specified to determine why the tag had been inappropriately placed.

The nine significant PERs were also evaluated in regard to corrective action and appropriateness of PER closeout. The team concluded that the corrective actions for four (294-0843, 294-0798, 294-0733, and 294-0814) of the nine PERs did not address the identified causes. In addition, two (i.e., 294-0733 and 294-0814) of the nine PERs were prematurely closed out. Details of the subject PERs were discussed with licensee managers.

The licensee's QA audit program identified inconsistencies in the root cause between PERs and licensee event reports (LERs) addressing the same issues or events. PER 295-902 was initiated to identify and correct the problem. The team verified that, the corrective action required the dispositioning manager for PER 295-902 to evaluate the LERs for potentially incorrect statements, reevaluate the inconsistencies as they pertained to root cause and corrective action, meet with the dispositioning managers of the subject PERs and resolve the inconsistencies, and change the appropriate LER and PER processes to prevent the inconsistencies from recurring. The team concluded that the licensee's identification of the inconsistencies in the root cause between the PER and LER processes was a strength of the QA program.

2.1.3 PER Enhancement Initiative

Because of previous concerns in this area, plant management had initiated two programs to improve PER initiated root cause analysis and corrective actions. Details of the programs are incorporated in procedure PPM 1.3.12A "Processing of Problem Evaluation Requests (PER)."

Quality Assurance Review

The QA organization had reviewed all completed PERs to ensure that adequate corrective actions were implemented. At the time of the inspection, the process had been in effect for approximately 6 weeks. Initial results showed that approximately 40 percent of the completed PERs were rejected by QA and returned for additional work. The team identified only one PER (295-0758), where the QA review did not detect inadequate corrective actions. A procedure to perform a one-time test of emergency diesel generator (EDG) relays failed to check for relay misalignment. The listed corrective action was to counsel system engineers to increase awareness of the necessity of a thorough restoration of equipment. The licensee agreed that the corrective actions should have addressed the inadequate procedure. In terms of the QA review this appeared to be an isolated case.

Corrective Action Review Board

The corrective action review board (CARB) initiated a review of all significant PERs. Of the first 17 significant PERs to go through the CARB review, 10 were sent back for further work, 6 were revised, and 1 was acceptable. PER 295-730 had been returned because of inadequate corrective actions. The original corrective action had addressed the improper signing for a procedure verification step. The CARB added corrective actions to specify acceptance criteria and to increase the scope of personnel authorized to sign for the verification step. During a CARB meeting, observed by the team on August 15, the CARB dispositioned three PERs: 295-0784 (high radiation area entry), 295-508 (equipment lacked wheel restraint), and 295-509 (gas cylinder handling and storage). All three PERs were sent back to applicable managers for additional action.

The CARB review and the QA oversight activities indicated a recognition by the licensee that root cause determinations and corrective actions in the PER process needed to be improved. Initial activities by the review groups appeared to be successful. Continued evaluations are required to assess the long-term effectiveness of the programs.

2.1.4 Trending

The licensee's trending program is detailed in procedure PPM 1.3.12A. The team reviewed the process for identifying adverse trends. The staff was very knowledgeable and readily discussed the various adverse trends that had been identified. A history of adverse trends existed in the human performance area and corrective actions to date had been ineffective. For example, there was an adverse trend in the improper lifting and landing of electrical leads and various corrective actions had been implemented. However, just before the inspection, a technician and his assistant verifier lifted an improper lead which resulted in a feedwater transient. The panel and terminal board were properly tagged, the procedure was clearly written, and an independent verifier was present, all of which should have helped to prevent this event.

The licensee's quarterly PER trend report showed the following notations: under the Hardware/Equipment Category, "Needs Improvement;" under the Documents/Procedures Category, "Needs Substantial Improvement;" under the Personnel Error Category, "Needs Substantial Improvement;" under the Process/Programmatic/Training Category, "Needs Improvement;" and under Significant PERs, "Needs Significant Improvement." Overall, the trending program appeared to be adequate in identifying adverse trends.

2.2 Human Performance

2.2.1 Safety Focus and Management Involvement

The team reviewed NRC inspection reports and licensee event reports in order to assess the licensee's safety focus and management involvement in the area of human performance. The team determined that over the 6 months before the inspection, the licensee had not been effective in implementing programs that show root cause and reduce the occurrence of human performance problems in areas such as clearance orders, verifications and self checks, communications, and configuration controls.

2.2.2 Problem Identification and Resolution

The team selected the following recent examples to evaluate the licensee's effectiveness in problem identification and resolution of events related to human performance problems:

On both May 7 and August 9, 1995, the same high-high radiation door was discovered unlocked, which was inconsistent with both plant procedure and technical specifications.

On June 22, 1995 (PER 295-0784), a mechanical craft supervisor and mechanic entered a high radiation area without a pre-job briefing which was inconsistent with a plant procedure. (Discussion of this event during the CARB's August 15, 1995 meeting is addressed in Section 2.1.3 of this report.) PER 295-0784 identified the probable cause as failure to perform a self check. The corrective actions and generic impact evaluation did not address human performance issues associated with the event.

On February 11, 1995, personnel inadvertently started to perform maintenance on condensate demineralizer resin trap 1D rather than 1E. The associated PER 295-0097 did not assess the generic impact of human performance issues related to the event.

Section 6.4.3 of Procedure 1.3.12A, "Processing of Problem Evaluation Requests" requires that a generic impact evaluation should be completed if a potential for a similar deficiency exists elsewhere at WNP-2. If applicable, investigative and corrective actions should be initiated if the apparent cause of the condition is such that its existence is likely elsewhere, and if previous events of a similar nature had occurred at WNP-2 or elsewhere.

Generic impact evaluations were inadequate or non-existent for the above PERs. Failure to assess generic impact is a weakness in the licensee's root cause and corrective action program and a contribution factor to repetitive human performance problems at WNP-2, and is identified as Observation 95-201-03.

2.2.3 Programs, Procedures, Instructions, and Initiatives

The WNP-2 Business Plan which is updated quarterly, includes a recently added initiative, "Operational Performance-9, Human Performance Improvement," with the objective to reduce the overall number and rate of personnel errors and the significance of any errors that continue to occur. The Executive Assistant to the Managing Director stated that this was an initiative that would be implemented plant wide.

The team concluded that the Business Plan represents the basis for the licensee's effort to address the human performance issues. At the time of the inspection the following programs were in the early stages of inception.

Peer Review Team

The peer review team's (PRT's) charter provides for evaluation of selected plant events for root cause determination, and the review of PER corrective actions and assessment of effectiveness. At the time of the inspection, the PRT was completing a survey of plant personnel "for targeting weak areas in need of improvement." The team concluded that the PRT was a strength in addressing human performance problems.

Operations Instruction (OI-9) "Expectations for Supervisory and Peer Oversight"

This instruction has been implemented in the operations department since October 1994. The program is designed to improve the supervisory role of Operations Department manager and supervisors in order to improve personnel performance. At the Operations Managers' discretion, this instruction may be required to be performed by non-supervisory personnel in the Operations Department. The human performance coordinator stated that the OI-9 program was expected to be implemented plantwide by January 1, 1996.

Gold Card System

This system is currently a pilot program in the Operations department. The Director, Operations, stated that this program allowed plant personnel to easily provide feedback (strengths and weaknesses) on problems that do not reach the threshold of a PER and on precursors to events. The human performance coordinator stated that the Gold Card system was expected to be implemented plantwide by January 1, 1996.

2.3 Quality Assurance

The quality assurance (QA) function is a part of the Quality Directorate, which also includes supplier quality and quality control. The QA organization

had performed various self-assessments and the audits required by the Technical Specifications (TS).

2.3.1 QA Audits

The team reviewed the following TS required audits: 94-04, 94-12, and 95-16. The audits identified various technical and program deficiencies. Audit 95-16 extensively documented the various human performance-related trends and identified 261 human performance issues in the previous 26 months.

2.3.2 Findings and Recommendations

The QA organization made numerous recommendations, but identified only one "finding" in the last two audits, which was directed at the QA organization for not validating PERs. The recommendations were weak in that they did not provide clear corrective actions for resolution of the issues. For example, typically recommendations stated: "Evaluate the need for closer scrutiny...," "Evaluate the need to reinforce management expectations..." In each case the QA organization had not provided or solicited substantive recommendations for corrective action. The QA finding and recommendations resulted in the initiation of PERs.

QA management stated that it recognized the problems with QA recommendations and plant corrective actions and that it was making process changes. For example, it was going to strengthen the recommendation process to provide more substantive recommendations. The corrective action review and closeout process was no longer going to accept statements such as "further review and evaluation to determine corrective actions" as resolutions of the problem.

2.3.3 Corrective Actions

The QA organization noted that two PER reportability evaluations were untimely (55 days and 35 days rather than the expected 14 days). The site response indicated that continued enhancements to the PER process and improved staffing levels would lead to continued improvement. This item was then closed. However, during the 1995 refueling outage the 14 day goal repeatedly could not be met. In another example, the QA organization noted that PERs were not being dispositioned within 30 days according to program expectations and recommended that management expectations regarding timeliness be reinforced. The site response was that it was only an expectation, was not significant and had no consequence. This item was then closed. In some cases specific corrective actions were not identified in that the dispositioner stated that the issues would be reviewed or evaluated at a later date and then requested that the item be closed. The premature closing of QA findings without appropriate corrective actions is identified as Observation 95-201-04.

Emergency Diesel Generator Start Failures

While reviewing the corrective actions for an issue identified by Audit 94-12, the team noted that there had been several failures of a emergency diesel generator (EDG-2) to start. The auditor had raised concerns about the number of failures and recommended a review of the failures and asked that

documentation be prepared to inform the plant about valid and invalid failures in the last 100 starts. The team found that some of the failures identified by the licensee as not valid appeared to be valid failures. These included failure of the electronic Woodward governor, and failure of the reverse power relay that could have prevented closure of the EDG output breaker during a loss-of-offsite-power event. The team considered that they were valid failures according to Regulatory Guide 1.108; the licensee did not agree. This concern is identified as an Unresolved Item 95-201-01.

2.3.4 Audit Followup

The implementation of corrective actions for human performance problems identified in QA recommendations was slow. For example, corrective actions indicated that a peer review team would be in place by January 1995 and with QA participation. However, the peer review team program was not in place until June, 1995, and because of organizational changes there was no direct QA participation on the team.

The team reviewed PER 95-201 that addressed human performance issues identified in QA Audit Report 95-16. Although the PER was issued on March 24, 1995, and there was a PER program requirement to disposition corrective actions within 30 days, corrective actions were still being submitted during August 1995. The original plant responses were not adequate and had to be sent back to the plant staff to be resubmitted with additional corrective actions. Extensions to submittal dates had been granted, but were also missed indicating a continuing problem with the plant staff's timely response to QA identified issues. The lack of effectiveness to solicit and implement corrective actions in a timely manner is a weakness in the QA audit program identified as Observation 95-201-05.

2.4 Self Assessments

The team reviewed the licensee's "Mid-Cycle Systematic Assessment of Licensee Performance (SALP) Self Assessment" dated February 27, 1995, which covered licensee control systems, operations, engineering, maintenance, and plant support. Within the functional areas the subjects that showed minimum performance were problem resolution, ineffective prioritization, and inability to consistently identify causal factors. Specific weaknesses were identified in the areas of management involvement and problem resolution. Personnel error and lack of compliance with procedures were noted as weak areas where management's corrective actions had not been fully effective. The team concluded that the licensee's self assessment was thorough and self-critical.

2.5 Operating Experience Feedback

The team reviewed WNP-2's operating experience feedback (OEF) program to evaluate the timeliness and adequacy of the corrective actions related to the program. The review focused on the licensee's effectiveness in evaluating operating events, informing appropriate personnel of the results, and initiating corrective action for information obtained both within and outside the licensee's organization.

Administrative Procedure 1.10.4, "External Operational Experience Review," Revision 11, described the WNP-2 external operating experience review (OER) program and stated that the purpose of the program was to reduce the risk of occurrence at WNP-2 of events or conditions experienced at other plants. Under the OER program, information regarding events was assessed and, where applicable, was used to improve WNP-2 practices, procedures, and equipment. In addition, Procedure 1.10.4 stated that if at any point during the OER process there was reason to believe that plant practices, procedures, or equipment might not be in compliance with requirements or might require an operability or reportability review, a PER shall be initiated.

The team reviewed 13 PERs and determined that the OER program had identified events applicable to WNP-2. In addition, the actions to correct potential problems or to improve equipment or processes had been identified and tracked to completion in the plant tracking log. The licensee had assigned a dispositioner to identify and evaluate all issues in the source document. The dispositioner evaluated the source document, identified any lessons learned to prevent or mitigate the event, determined the impact of the issue on operability of plant equipment, and considered the need for immediate corrective actions. Overall, the program was effectively implemented.

The PERs reviewed were satisfactory in depth and scope of evaluations of the particular issues presented by the source documents. Overall, the OER program identified and tracked to completion applicable issues for WNP-2.

3.0 MAINTENANCE

3.1 Work Control

Just before the 1995 refueling outage, the maintenance planning, scheduling, engineering, and production functions were reorganized. At the time of the inspection, the maintenance shops were the responsibility of the maintenance manager, and the work control activities related to maintenance planning, setting priorities and scheduling were under the direction of the planning, scheduling, and outage manager, a newly created position. Maintenance engineering activities were now the responsibility of the system engineers. Before the last outage, all these activities had been under the direction of the maintenance manager.

The team conducted interviews, reviewed guidance documents, and observed planning and scheduling activities to evaluate the work control process that was in place since the start of the previous outage. Plant-related maintenance work on the site was scheduled and controlled in accordance with Procedure 1.3.7, "Work Management-Passport Process," Revision 21. Attachments A-J to the procedure dealt with specific elements within the work control process such as emergency maintenance, planning, scheduling, and generation of work documents.

The licensee was planning to implement a workweek team approach to the work control aspect of maintenance before the end of the calendar year. This process would use multidisciplinary work teams with accountability for

completing elements of work control by addressing key work management functions for a week work window. Six workweek teams had already been formed.

3.1.1 Scheduling

Planning, scheduling, and outage management organizations had implemented a new format for scheduling daily work based on the rolling 12-week schedule for corrective and preventive maintenance. The daily schedule process also had elements for immediately scheduling emerging work and identifying facility-limited conditions for operation that were dependent on the maintenance organization for resolution. A desk top work coordination instruction had been developed and implemented by the planning, scheduling, and outage manager to provide a guide for the daily scheduling effort.

The licensee process included a series of weekday meetings to coordinate and monitor work. The initial daily meeting was a 5:15 a.m. turnover meeting between the operations shift manager and one of four designated work control representatives. During these meetings, the team observed that valuable information was exchanged between work control and operations personnel. A work control representative learned that a task could be performed on an existing clearance instead of initiating another identical clearance, and gained information that would be needed to integrate emerging work into the existing schedule.

In a meeting between a scheduler and three mechanical maintenance shop supervisors, the scheduler identified the support needed by maintenance personnel to accomplish scheduled and emerging work. Following this meeting, the team observed the mechanical and electrical schedulers assemble and publish the daily maintenance schedule. This schedule was needed to support a daily work control meeting at 7:15 am, supervised by work control personnel and attended by representatives from the following organizations: operations, maintenance, chemistry, radiological protection, technical services and planning, scheduling, and outage. During several of these 7:15 am meetings, the team observed attendees exchange information regarding work not accomplished as scheduled, emergent work, and task priority. Each task performance group representative informed the other attendees of support that was needed from other groups such as clearances, lineups, and radiological protection coverage. By the second week of the inspection, these support assignments appeared on the daily schedule.

3.1.2 Planning

The team interviewed planning personnel and reviewed documents that provided guidance for the maintenance planning function. A "minor" maintenance program permitted maintenance supervisors to issue work instructions for minor tasks in lieu of providing the craft person with planned, detailed work order packages.

Administrative requirements for planning were found in Procedure 1.3.7, Attachment D; requirements for the preparation of work instructions were found in Maintenance Instruction MI 4.1, "Work Instruction Preparation Guide," Revision 6.

The team sampled requests for work to be done as minor maintenance and found that all tasks met the current criteria for being performed as minor maintenance. The minor maintenance program had undergone significant expansion since its inception. Licensee personnel were aware of the potential to negatively affect the schedule by overloading the process and the possible failure to adequately plan more complex tasks on safety-related equipment. The team found that in one instance a shift manager had overruled a decision by a work group supervisor to work a task as minor maintenance. This occurred during replacement of a relay in the radiological waste processing system when operations personnel expressed doubts about the predicted effect of de-energizing circuits for replacing the relay. Overall, the minor maintenance program was satisfactorily implemented and had improved the efficiency of the licensee's overall maintenance effort.

The team evaluated the planning group requirements for the planning of maintenance. Planners received requests for planning via the work control database based on the rolling 12-week schedule. Management's expectation was for the planning process to be completed by the seventh week before the work initiation date. The planner's performance appraisal elements addressed this expectation as well as how they managed their own work and supported the maintenance shops.

Administrative requirements for planning were found in Procedure 1.3.7, Attachment D; requirements for the preparation of work instructions were found in Maintenance Instruction MI 4.1, "Work Instruction Preparation Guide," Revision 6.

A recent change to the planning administrative policy required that all planned packages be reviewed and approved by appropriate system engineering personnel. Some of the planners disagreed with the requirement because some engineers were inexperienced in the planning process in areas such as post-maintenance testing, foreign material exclusion, and system and component cleanliness. Also, a planner recently had not been able to obtain on-site engineering approval for an emergency work package. However, planning personnel were fully supportive of an initiative implemented before the most recent outage asking craft personnel to review, walk down, and provide feedback on all work packages planned for the outage.

Personnel responsible for generating work instructions indicated an ongoing difficulty in understanding the desired level of detail for work instructions. Apparently, the desired level had varied as far back as the previous SALP cycle. Planning personnel interviewed stated that expectations had changed and the present trend was toward less detail. Section 4.8.3 of the procedure indicated that the level of detail in work instructions was to be commensurate with the skills of the craftsmen, and the required skills were listed in the maintenance training program. However, according to maintenance personnel, the description of required skills, in the training program lacked the detail needed for specific maintenance tasks, resulting in inconsistent work instructions to the craft personnel.

In conclusion, the work control process had undergone considerable change since the maintenance functional area had been reorganized under separate managers for shop performance and work control. Work control problems were still being encountered, but the problems were being identified and adequately addressed by management. Within the work control group, employees were generally aware of performance requirements and good standards were in place for assessing employee performance.

3.2 Quality Assurance Audits and Corrective Action Program

The team reviewed the line organization's responses to the two most recent QA audits in the maintenance functional area. For Quality Assurance Technical Assessment 294-061, the QA findings were issued in the form of three PERs. Two of the PERs dealt with minor failures of maintenance personnel to precisely follow procedures being used in the performance of non-safety-related activities. A third PER dealt with the failure of supervisory personnel to update the work control database as required. The three PERs had been closed. The generic implications for the PERs concerning nonadherence to procedures had not been considered.

Quality Assurance Technical Assessment 295-035 was issued a month after the most recent outage and addressed maintenance functional area performance during the outage. Eight PERs were written to document the assessment findings. Five of these PERs addressed violations of licensee industrial safety requirements, such as, unsecured compressed gas bottle cylinders or utility carts used by maintenance personnel to transport tools and equipment to and from a work site. The approved corrective actions for the three remaining PERs did not address the common problem of maintenance personnel failing to comply with industrial safety requirements. Near the end of the inspection, the CARB addressed this issue, which is covered in Section 2.1.3 of this report.

The QA organization issued 12 recommendations in the two assessments. The implementation of QA recommendations was not tracked or evaluated for effectiveness. Additional QA audit weaknesses are addressed in Section 2.3 of this report.

3.3 Preventive Maintenance

The majority of preventive maintenance tasks were being completed within the scheduled window which includes the allowable extension of 25 percent of the preventive maintenance cycle interval. The preventive maintenance program was being conducted in accordance with Plant Procedures Manual Procedure 1.5.13, Revision 3, "Scheduled Maintenance System."

For 1995 approximately 230 tasks had been performed past their late date, and 20 were open and late as of August 10, 1995. These numbers were considered small compared to the approximately 9,400 preventive maintenance tasks that came due during the calendar year. During 1995 through August 9, 1406 requests for changes to the preventive maintenance system had been processed. Approximately 273 of these requests were classified as some kind of deferral or changes to the due date.

Procedure 1.5.13 stated that deferred preventive maintenance tasks should appear on the a late report. If a preventive maintenance task were to be deferred for one or more cycle intervals, the processing clerks would assign on the computerized tracking system a arbitrarily completion date to the preventive maintenance task. Because of the arbitrary completion date, the task would not indicate late or deferred on the management reports. To track the actual status of the preventive maintenance program a manual search of the change request documents was required. The lack of information in the tracking system regarding deferral and lateness of PM's was a weakness in the deferral process.

The team reviewed a sample of deferred preventive maintenance tasks by evaluating the associated change request documents. The deferrals were reasonably justified and did not impact the operability of the system. However, some equipment qualification preventive maintenance tasks and those designated as "essential" by the licensee, did not receive an operability or reportability review prior to deferral. Procedure 1.5.13 required that essential and equipment qualification preventive maintenance tasks that could not be scheduled and performed prior to their late date shall have a PER written to evaluate the operability of the equipment and determine if there were any reporting requirements. The licensee's failure to evaluate the effect of deferrals of preventive maintenance on the operability of equipment is identified as Deficiency 95-201-01.

In response, the licensee assessed the operability of essential equipment presently on the deferral list. No operability issues were identified. The licensee stated that the requirements of the procedure will be evaluated for appropriate implementation.

It was determined that despite some weaknesses with tracking of the preventive maintenance tasks, the backlog was minimal, and did not negatively impact the operability of plant equipment.

3.4 Equipment Clearance Order Errors

The team reviewed 12 PERs addressing clearance order implementation errors. In all cases, the root cause of these events was tied directly to personnel errors. Seven of these PERs stated that there was no generic impact to the event, and that the event was isolated. Only PERs 295-0408 and 295-0106 provided for any generic corrective action involving the equipment clearance order process, and this was narrow in scope. A review of authorized work order tasks with multiple clearances had been performed under PER 295-0408, and expectations for how to perform a second-level review were delineated under PER 295-0106. None of these PERs addressed the continuing problem with failure to properly implement the requirements of the equipment clearance order program or mentioned that a negative trend was evident. This is another example of weaknesses in the licensee's assessment of problems for generic impact as discussed in Section 2.2.2 of this report.

3.5 Maintenance Backlog

As of June, 1995, the total inventory of non-outage work orders was approximately 1000 work items. The outage backlog was 508. The team reviewed the backlog of several safety-related systems and determined that the backlog did not have a negative impact on the system operability.

Procedure 1.3.7C, Revision 5, "Work Request Screening and Evaluation," Step 5.2.9.b required that Priority 2 work orders be worked with all required plant resources during normal hours up to 7 days a week. The team noted that upwards of 230 Priority 2 work orders were open on August 15, 1995. Many of these items did not require and were not getting the attention specified in the procedure for Priority 2 work. Priority 3 work was routinely being performed before these Priority 2 items. The licensee's failure to re-evaluate and properly prioritize certain maintenance items was a weakness identified as Observation 95-201-06. The licensee appeared to have reduced the backlog to manageable levels.

3.6 Trending and Area Self Assessment

The maintenance group trended 39 performance indicators on a monthly basis to assess its performance. Some of the trended parameters reflecting human performance went back to July 1992. Data was supplied to the maintenance group from the PER coordinating organization. Based on the number of PERs, determined to be attributable to human performance error, trends were developed to reflect the number of errors by the different disciplines in the maintenance group. These trends were normalized by calculating the error rate with respect to the staff-hours worked. PERs dealing with failure to adhere to procedures were not considered as human errors. In addition, the licensee's maintenance organization did not track or trend rework in any form and was unable to provide any information in this area. The failure to track rework could inhibit valuable management insight and decisionmaking in the areas of training, special equipment purchase, and procedure revision. The weaknesses in the licensee's maintenance program regarding trending are identified as Observation 95-201-07.

3.7 Maintenance Performance Observation

The team observed technicians attempting to a calibrate the Train "A" control and indicating instrument loop used to automatically isolate the technical support center ventilation system during accident conditions. The preventive maintenance program calibration provided assurance the equipment would perform its safety function. The task guidance was provided in Procedure 10.24.199, "Instrument Maintenance, Air Monitor Corporation Air Flow Control, Indication, and Alarm Center," Revision 4. There had been previous problems encountered during this calibration. The plan was to perform the procedure and use the licensee process for procedure deviation whenever it was necessary. At the time the team began its observation, the procedure had already undergone two deviations.

During the initial calibration attempt, the technician installed a jumper not called for in the procedure. However, the information was hand written in the comment section of the instrument work sheet stating that the jumper was needed to perform the task. The licensee stated that this step will be incorporated into the procedure. The technicians were able to obtain a satisfactory transmitter calibration check in the increasing differential pressure direction. They were also able to verify that the relay providing the isolation signal would allow the system to be unisolated above a system flow rate of 100 cubic feet per minute. However, the test equipment being used was not adequate to verify the calibration points and isolating relay drop out point during decreasing differential pressure, as required by procedure. The technicians stopped the calibration procedure to resolve the problem with the test equipment.

The records showed that technicians during previous calibrations had always obtained the data needed in the decreasing direction. Previous calibrations had been performed using a digital manometer. During the calibration attempt witnessed by the team, this equipment was not available. Additionally, the procedure did not reference the specific test equipment and personnel performing the calibration were not aware of the need for specific test equipment. The calibration effort was terminated.

In conclusion, the procedure lacked sufficient detail by failing to specify the proper test equipment and to address the requirement to jumper a component to perform the task. However, the licensee recognized and addressed the problems.

4.0 ENGINEERING

4.1 Previously Identified Issues

The following are licensee actions to address concerns identified in NRC Inspection Report 95-03:

- Set Point Data Sheet Revision, Section 2.1.1.3

  The set point data sheets for the diesel starting air system pressure switches did not contain a reference to the solenoid valve qualification limits. Since such information was lacking, the pressure switch setting could be changed to a higher value. The licensee had acknowledged this concern and stated that it would revise the set point calculation referenced in the set point data sheets.

  In set point calculation Number E1-02-91-1125, Revision 1, dated June 22, 1995, a reference to the solenoid valve qualification limits had been added, stating that the solenoid valves were qualified to 280 psi. This revision was being verified and tracked under PTL Item No. A-117179, scheduled for completion by September 6, 1995.

- Procedure Revision, Section 2.1.1.3

  The concern pertained to procedural clarification of the term "approval." A number of design documents had been prepared by an engineer who also had provided the cognizant engineer approval.

  During this inspection, the licensee was reviewing Procedure EDP 1.13, "WNP-2 Engineering Technical and Managerial Responsibilities," to address the concern pertaining to approval of design modifications by the same individual as the one who prepares the design package. This activity was being tracked by PTL Item No. A-117180, scheduled for completion by September 6, 1995.

- Testing of Molded Case Circuit Breakers, Section 2.1.4

  This concern pertained to the exercising of circuit breakers solely to improve breaker performance since test data obtained after exercising might not be representative of the as-found performance of the breaker.

  Procedure 10.25.48, "Testing Molded Case Circuit Breakers," dated March 28, 1995, Section 4.0, "Precautions and Limitations," had been revised to include the following statement: "Do not cycle breaker prior to obtaining as-found instantaneous trip test results, unless otherwise directed." This action adequately addressed the concern regarding the testing of molded case circuit breakers.

- Valve Orientation, Section 2.2.1.7

  Relief valve PSR-RV-118 was installed backward on the discharge of post accident sampling pump PSR-P-6, which provided sampling capability from the sump.

  Work Order Task No. KV50, which was initiated to reinstall valve PSR-RV-118 in the proper direction indicated that this task was completed on March 9, 1995.

In conclusion, the licensee was taking adequate corrective actions to ensure that these concerns documented in Inspection Report 95-03 were being properly addressed and tracked.

4.2 Modification Review

Plant Modification Record No. 93-0157-1 and associated Basic Design Change No. 93-0157-1B were reviewed. This modification was the replacement of four containment isolation valves, two wetwell exhaust purge isolation valves and two drywell supply purge isolation valves. These valves were installed during the 1995 outage.

The walkdowns before the modifications were turned over to the construction group included pictures of the existing valves to be replaced, and a computer-assisted design (CAD) program to check clearances against those of the

existing system. The CAD was used to determine how the new design would fit into the existing design envelope.

The screening and safety evaluations performed for the design changes in accordance with Section 50.59 of Title 10 of the Code of Federal Regulations (10 CFR) were adequate. Several field changes to the modification package also received appropriate 10 CFR 50.59 reviews, which concluded that the field changes would not affect the basic design changes. The 10 CFR 50.59 reviews included an Appendix R review and a technical specification amendment, which was approved by the NRC.

All supports were analyzed for the additional loading from the extra valve weight. This analysis was provided in Calculation Modification Record 94-0850 dated September 19, 1994. As shown in this calculation, the new loads and movements were the same as, if not lower than, the current loads. Each pipe support load tabulation was updated to reflect the new loads.

The team's visual inspection of the containment isolation valves installed during refueling outage R9, which were part of the same design change package, confirmed that the as-built installation was the same as the design drawings, including the associated field changes. These valves were accessible for inspection, whereas the recently installed valves were not. The team found a 4-foot length of instrument tubing between CSP-V-701 and PI-EFC-X66 that appeared to have no slope. Field Change Request 93-0151 directed the tubing to have a standard slope of 1/4 inch per foot. The licensee issued PER 295-0951 to address this matter. The PER operability assessment stated that there was no impact on system or component operability. The corrective action was either (1) change the affected drawing to indicate that no slope was required on the affected tubing or (2) effect a hardware change to obtain a specified slope. The team did not identify any other hardware configurations that did not conform to the design change drawings.

4.3 Engineering Backlog

The system engineering group was responsible for 73 PER corrective action items, which made up the majority of backlog items assigned to the engineering department. Licensee management considered the number of open items to be moderate and manageable. The licensee goal was to have all corrective actions completed in 60 days. PER dispositions were given top priority. Old or late PERs reviewed by the team had adequate justification to support closure at a later date. No safety concerns were identified during this review. The team concluded that the licensee was effectively managing the workloads so that a backlog of engineering tasks was not a problem.

Two of the 43 modifications in the backlog were safety related, modifications to the primary containment electric penetrations and the fire penetration seals. There were 183 work orders associated with these 43 modifications; 50 percent were in the planning stages. The remaining work orders were in various stages of approval, walkdown, work-in-progress, or field work completed awaiting turnover to the operations department. No modifications had been deferred during the 1995 outage.

The team interviewed system engineers regarding management expectations, the PER process, technical support, and engineering work load. It found that management expectations were adequately expressed and documented. System engineers viewed as positive the corrective action process and interaction with other departments for technical support. Although the existing work load was manageable, concern was expressed that future work loads, caused by recent layoffs, could reach the point where system and project engineers would not be able to adequately support plant operations. The team acknowledged these concerns and concluded that the current engineering backlog was managed by the licensee.

4.4 Reactor Feedwater Pumps

The team evaluated the engineering support provided to the operations department to resolve a deteriorating control problem with the reactor feedwater pumps (RFW) pumps. On August 10, 1995, the control room operators noted that the speed of RFW pumps A and B had been diverging. Troubleshooting plans were developed to evaluate the mechanical linkage of pump B to the servo valve. Reactor power was reduced from 100 percent to approximately 65 percent to accommodate the activity. During the initial increase in reactor power after a minor adjustment to the suspect linkage, operators noted that the problem was not resolved. Since the troubleshooting plan did not address additional or alternative activity, troubleshooting in the field had to be terminated. Due to a lack of an investigative plan at the time, operations decided to increase reactor power to 90 percent of rated capacity with potentially unreliable feed pumps.

Subsequently, an engineering team, stated that either pump could be malfunctioning. However, this fact was not clearly communicated to operations personnel. On August 13, the operations manager, on the basis of his assumption that the B pump speed controller was the cause of the problem, directed the control room crew to place the B pump controller in manual and to remove the bias from the A pump controller. This activity resulted in a feedwater transient that came close to causing a reactor trip.

The failure to develop a comprehensive troubleshooting process and to maintain communications between engineering and operations personnel were weaknesses that contributed to the unexpected challenges to the equipment and personnel. This concern is identified as Observation 95-201-08.

5.0 FIRE PROTECTION

The team assessed the corrective action program regarding the quality of the fire barrier penetration seals. It inspected of quality activities involving procurement, storage, installation, quality control, and long-term maintenance associated with the installation and maintenance of the penetrations seals.

The purchase order for the fire seal materials, Silicone SF-20 foam parts A and B, had been issued to Brand Fire Protection Services (Brand). Brand was qualified as a Quality Class 1 supplier according to the licensee's evaluated suppliers list (ESL). Brand had been placed on the ESL on the basis of an audit of its facilities by the Nuclear Procurement Issues Committee (NUPIC).

The NUPIC audit had identified four findings that were satisfactorily resolved during a followup verification performed at the Brand facility by NUPIC. Before placing Brand on the ESL, procurement engineering personnel had evaluated the NUPIC audit and past supplier performance (material problem history) and concluded that Brand was an acceptable supplier. The purchase order included the required specifications and quality requirements.

Receipt inspection was performed by quality control personnel on fire seal materials. A 1-year shelf life from date of shipment was provided as specified in the purchase order. The material was stored in closed containers in warehouse 2 under controlled conditions of temperature and humidity. The team concluded that the receipt inspection and storage control for the fire seal materials were satisfactory.

Quality control coverage included mandatory hold points on 100 percent of the essential fire penetration seal repairs. Quality control inspections were performed on 25 maintenance work requests from March 11 through July 31, 1995. Quality control inspector training included one week of performance-based training on how to perform the walk-down inspections. In addition, a 3-day training course, utilizing mockups of various penetration seals and hands-on training, was given on the installation and inspection of the fire penetration seals. This training provided the quality control inspectors with the expertise needed to verify that the penetration seals were installed in accordance with the approved test configurations. Personnel were certified on successful completion of these courses. Quality control coverage and training related to the fire penetration seals were outstanding.

The team conducted a joint walkdown inspection with the fire protection engineer and the walkdown coordinator of fire penetration seals repaired and inspected by the licensee. The purpose of this inspection was to observe typical fire penetration seals previously inspected by the licensee and to become familiar with the type of seals and deficiencies identified. This walkdown inspection included fire penetration seals located in the radwaste building, reactor building, reactor protective system No. 2 room, and the safe shutdown room. The team observed a fire penetration seal inspection in the reactor building at penetration seal P205-5033. Interviews with the two quality control inspectors indicated that they were adequately trained in and knowledgeable of their duties. The quality control inspectors used the penetration seal data sheet (checklist) and the penetration location drawing to perform their inspections.

The status of the licensee's penetration seal upgrade project as of August 8, 1995 was as follows: the walkdown phase was 58 percent complete. Based on the licensee's preliminary review of the inspection results, seal failures were approximately 10 percent. The walkdown phase was scheduled for completion by December 31, 1995. However, the licensee had not established a formal commitment date for completing of the repair phase of the penetration seal upgrade project.

The licensee's corrective action program involving the fire barrier penetration seals was a strength.

6.0 EXIT MEETING

On August 17, 1995, an exit meeting was conducted during which the team presented its findings. The following persons were in attendance:

U.S. Nuclear Regulatory Commission

W.P. Ang, Plant Support Branch Chief, DRS RIV
K.C. Barr, Sr. Resident Inspector
K.E. Brockman, Dpty. Dir., Div. of Reactor Safety, RIV
P.S. Koltay, Inspection Team Leader, NRR
D.P. Loveless, Sr. Resident Inspector, RIV
D. Pereira, NRC Inspector, RIV
M.C. Shannon, NRR
W.J. Wagner, Reactor Inspector, RIV
G. West, Jr., NRR
J.E. Whittemore, Reactor Inspector, RI

WNP-2

P.R. Bemis, Dir Reg. & Ind. Aff.
J.P. Burn, Director Eng.
W.A. Harper, Fire Protection
P. Inserra, Mgr. Quality Services
D.R. Kobus, Supv. Fire Protection
J. McDonald, Asst. Eng. Director
T.L. Meade, Mgr. Eng. Programs
M.M. Monopoli, Maint. Mgr.
J.J. Muth, Mgr. Quality Support
J.V. Parrish, VPNO
J. Partridge, Engineer
J. Pedro, Compliance Specialist
J. Peters, Asst. to QA Mgr.
C.J. Schwarz, OP Mgr.
G. Stafford, PSO Mgr.
D. Swank, Licensing Manager
B. Waddel, Mgr. Regulatory Support

APPENDIX A

Number	Report Section	Title
		Observations
95-201-01	2.1	Informal screening of PERs.
95-201-02	2.1.1	Weaknesses in initiating PERs.
95-201-03	2.2.2	Failure to identify generic implications of human performance issues.
95-201-04	2.3.3	Premature closing of QA findings.
95-201-05	2.3.4	Failure to implement QA audit findings in timely manner.
95-201-06	3.5	Weakness in the maintenance backlog priority system.
95-201-07	3.6	Maintenance rework data is not identified and trended.
95-201-08	4.4	Inadequate troubleshooting and communications for engineering support of operations.
		Unresolved Items
95-201-01	2.3.3	Additional information is needed to determine the validity of Emergency Diesel Generator failure to start.
		Deficiency
95-201-01	3.3	Failure to evaluate the effect of deferral of preventive maintenance on the operability of essential equipment.