

November 7, 2005

EA-01-083

Mr. R. Anderson
Vice President
FirstEnergy Nuclear Operating Company
Perry Nuclear Power Plant
10 Center Road, A290
Perry, OH 44081

SUBJECT: PERRY NUCLEAR POWER PLANT
NRC INTEGRATED INSPECTION REPORT 05000440/2005009

Dear Mr. Anderson:

On September 30, 2005, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Perry Nuclear Power Plant. The enclosed report documents the inspection findings which were discussed on October 4, 2005, with you and other members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel. In addition to the routine NRC inspection and assessment activities, Perry performance is being evaluated quarterly as described in the Assessment Follow-up Letter - Perry Nuclear Power Plant, dated August 12, 2004. Consistent with Inspection Manual Chapter (IMC) 0305, "Operating Reactor Assessment Program," plants in the Multiple/Repetitive Degraded Cornerstone column of the NRC's Action Matrix are given consideration at each quarterly performance assessment review for (1) declaring plant performance to be unacceptable in accordance with the guidance in IMC 0305; (2) transferring to the IMC 0350, "Oversight of Operating Reactor Facilities in a Shutdown Condition with Performance Problems," process; and (3) taking additional regulatory actions, as appropriate. On August 31, 2005, the NRC reviewed Perry operational performance, inspection findings, and performance indicators during the second quarter of 2005. Based on this review, we concluded that Perry is operating safely. We determined that no additional regulatory actions, beyond the already increased inspection activities and management oversight, are currently warranted.

Based on the results of this inspection, seven findings of very low safety significance, all of which involved violations of NRC requirements, were identified. However, because of their very low safety significance and because they have been entered into your corrective action program, the NRC is treating these findings as non-cited violations in accordance with Section VI.A.1 of the NRC's Enforcement Policy.

If you contest the subject or severity of a non-cited violation, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with a copy to the Regional Administrator, U.S. Nuclear Regulatory Commission - Region III, 2443 Warrenville Road, Suite 210, Lisle, IL 60532-4352; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the Resident Inspector Office at the Perry Nuclear Power Plant.

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Sincerely,

/RA/

Mark A. Satorius, Director
Division of Reactor Projects

Docket No. 50-440
License No. NPF-58

Enclosure: Inspection Report 05000440/2005009
w/Attachment: Supplemental Information

cc w/encl: G. Leidich, President - FENOC
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U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No: 50-440

License No: NPF-58

Report No: 05000440/2005009

Licensee: FirstEnergy Nuclear Operating Company (FENOC)

Facility: Perry Nuclear Power Plant, Unit 1

Location: Perry, OH 44081

Dates: **July 1 though September 30, 2005**

Inspectors: R. Powell, Senior Resident Inspector
M. Franke, Resident Inspector
J. House, Senior Radiation Specialist
F. Ramirez, Reactor Engineer

Approved by: E. Duncan, Chief
Branch 6
Division of Reactor Projects

Enclosure

SUMMARY OF FINDINGS

IR 05000440/2005009; 07/01/2005 - 9/30/2005; Perry Nuclear Power Plant; Equipment Alignment, Fire Protection, Operator Performance During Non-Routine Evolutions and Events, Surveillance Testing, Occupation Radiation Safety, Identification and Resolution of Problems

This report covers a 3-month period of baseline inspection. The inspection was conducted by the resident and regional inspectors. This inspection identified seven Green findings, all of which involved non-cited violations. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter 0609, "Significance Determination Process." Findings for which the Significance Determination Process does not apply may be "Green" or be assigned a severity level after Nuclear Regulatory Commission management review. The Nuclear Regulatory Commission's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 3, dated July 2000.

A. Inspector-Identified and Self-Revealed Findings

Cornerstone: Initiating Events

- Green. A finding of very low safety significance and a non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," was self-revealed on August 12, 2005, when licensee personnel failed to promptly correct a condition adverse to quality. Specifically, on July 2, 2005, licensee personnel identified that the reactor water cleanup system valve nest room had elevated temperatures. Shortly thereafter, the licensee's problem solving team identified that a leak detection thermocouple was not providing an indication representative of actual room temperature due to its location. The improper placement of the thermocouple was not promptly corrected. The licensee failed to resolve the issue in a timely manner in that a reactor water cleanup system automatic isolation, an engineered safety feature actuation, occurred on August 12, 2005. Additionally, interim licensee actions to reduce room temperature, such as through securing a reactor water cleanup pump, had an adverse impact on plant performance in that the licensee concluded that the system manipulations induced a reactor water cleanup system leak on a non-regenerative heat exchanger vessel flange. The reactor water cleanup system was placed back in service on August 12, 2005, the thermocouple was relocated on August 14, 2005, and the heat exchanger vessel flange leak was stopped on September 6, 2005.

The inspectors determined that the issue was more than minor because it could reasonably be viewed as a precursor to a more significant event. The inspectors determined that the finding was of very low safety significance because the finding: (1) did not contribute to the likelihood of a loss-of-coolant-accident initiator; (2) did not contribute to both the likelihood of a reactor trip and the likelihood that mitigation equipment or functions would not be available; and (3) did not increase the likelihood of a fire or internal/external flooding. The primary cause of this finding was related to the

cross-cutting area of Problem Identification and Resolution, subcategory corrective action, in that the condition adverse to quality was not promptly corrected. (Section 1R14.2)

Cornerstone: Mitigating Systems

- Green. The inspectors identified a finding of very low safety significance and a non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," when licensee personnel failed to correct a condition adverse to quality in a timely manner. Specifically, licensee personnel identified and documented on seven occasions from June 2002 through February 2005, boron accumulation on the standby liquid control system storage tank heater flange. In each instance the issue was identified as a "condition adverse to quality." The inspectors identified additional documentation of leakage and boron accumulation in the flange area dating back to April 28, 1997. As of July 29, 2005, the condition adverse to quality had not been corrected. The licensee entered the "untimely resolution of a condition adverse to quality" into their corrective action program and confirmed for the inspectors that the issue was included in the next planned refueling outage for resolution.

The finding was more than minor because, if left uncorrected, the finding would become a more significant safety concern. Specifically, the failure to repair the degraded flange connection allowed a condition to exist that could lead to increased leakage or premature failure of the connection. Further, as noted on multiple licensee condition reports, the leakage had on occasion migrated to other levels of containment which if left uncorrected could result in other adverse consequences. The inspectors determined that the finding (1) did not involve a loss of safety function and (2) did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. The inspectors therefore concluded that the finding was of very low safety significance. The primary cause of this finding was related to the cross-cutting area of Problem Identification and Resolution, subcategory corrective action, in that the condition adverse to quality was not corrected in a timely manner. (Section 1R04.1)

- Green. The inspectors identified a finding of very low safety significance and a non-cited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," when licensee personnel failed to control deviations from design standards. On July 22, 2005, while performing a fire protection inspection in the intermediate building, the inspectors noted that a large storage cage (approximately 900 square feet in area and 10 feet high) was constructed in such a way that it interfered with the design rattle space between the containment shield building and the intermediate building column supports at several locations. The steel used to brace the cage directly communicated the containment shield building to the columns that supported the intermediate building. The inspectors reported the observation to the licensee and the licensee corrected the condition the same day. The primary cause of this finding was the failure to properly control deviations from design standards. The design seismic analysis of the building structures credited the rattle space in lieu of further analysis of the interaction between building structures; therefore, the interference of this space was not consistent with the design basis.

The finding was more than minor because it was associated with the mitigating system cornerstone attribute of design control and affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences in that it placed safety-related building structures in an unanalyzed condition. The inspectors determined that the safety functions of the buildings were maintained and therefore concluded that the finding was of very low safety significance. (Section 1R05)

- Green. A finding of very low safety significance and a non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," was self-revealed when residual heat removal containment spray isolation valve 1E12F028B failed to indicate open in the control room as expected during quarterly surveillance testing on June 25, 2005 due to inadequate maintenance. Operators declared the valve inoperable and isolated the associated penetration flow path for the valve in accordance with Technical Specification 3.6.1.3. This resulted in the unavailability of residual heat removal 'B' low pressure core injection and containment spray modes of operation. Subsequent visual inspection and electrical checks by licensee technicians revealed inadequate electrical connections in the electrical panel associated with the valve. The connections were repaired and the availability of residual heat removal 'B' low pressure core injection and containment spray was restored. The primary cause of this finding was the failure to promptly identify and correct conditions adverse to quality during maintenance associated with the valve actuator motor replacement that was performed in March 2005.

The finding was more than minor because it was associated with the reactor safety mitigating systems cornerstone attribute of equipment performance, and it affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable events. Specifically, the failure to identify the inadequate electrical connections following maintenance in the panel subsequently resulted in a failed control room indication on June 25, 2005, which caused operators to isolate the associated penetration flow path for the valve. This resulted in the unavailability of the residual heat removal 'B' low pressure core injection and containment spray modes of operation for about nine hours. The inspectors determined that the finding was of very low safety significance because the equipment safety function was not lost for greater than the Technical Specification allowed outage time. The primary cause of this finding was associated with the cross-cutting area of Problem Identification and Resolution, subcategory identification, in that improperly fastened electrical connections affecting a safety-related valve were not promptly identified. (Section 1R22)

- Green. A finding of very low safety significance and a non-cited violation of Technical Specification 5.4, "Procedures," was self-revealed on March 2, 2005, during disassembly of the Division 1 emergency service water pump. Specifically, the licensee failed to provide adequate guidance in General Maintenance Instruction 0039, "Disassembly/Assembly of the Emergency Service Water Pumps," Revision 8, to ensure that the lineshaft sleeve spirol pins were adequately staked during pump assembly in May 2004. Due to the improper assembly, the pump's lineshaft sleeve spirol pins were found, in March 2005, to be extruded and sheared. Fortuitously, the pins galled to the shaft and the lineshaft sleeve remained in place. As a result, no actual loss of safety

function occurred. The licensee's corrective actions included a procedure revision and subsequent pump repair.

The finding was more than minor because, if left uncorrected, the failure to implement appropriate procedures for safety-related pump maintenance activities could reasonably be viewed as a precursor for a more significant event as evidenced by two previous Division I emergency service water pump failures in September 2003 and May 2004. The inspectors determined that the finding was of very low safety significance because there was no loss of safety function. The finding affected the cross-cutting area of Human Performance, subcategory organization, because licensee personnel failed to establish appropriate procedures. (Section 40A2)

Cornerstone: Occupational Radiation Safety

- Green. A finding of very low safety significance and a non-cited violation of Technical Specification 5.7.1 was self-revealed when, in two separate instances, contractor radiation workers were found inside posted high radiation areas without being signed on the appropriate radiation work permits for these areas. Specifically, in the first instance, on January 10, 2005, a contractor supervisor was observed inside a posted high radiation area/contaminated area without the required protective clothing. The individual was determined to be signed on a low risk radiation work permit for heater bay work. The individual did not receive the required high radiation area briefing for the turbine condenser bay area (a posted high radiation area) and was not signed on the required higher risk radiation work permit. In the second instance, on March 8, 2005, a radiation protection technician discovered two contractor radiation workers, that were signed on a low risk radiation work permit for work in the turbine heater bay, in a high radiation area and had not received the required high radiation area briefing for the residual heat removal heat exchanger room. The workers failed to sign off of the low risk radiation work permit and to sign on to the medium risk radiation work permit and did not obtain a radiation protection brief prior to entry into this room. Corrective actions taken by the licensee included restricting the individuals from the radiologically restricted area.

The finding was more than minor because the finding was associated with the human performance attribute of the occupational radiation safety cornerstone and affected the cornerstone objective of ensuring adequate protection of worker health and safety from exposure to radiation. The finding was of very low safety significance because it did not involve: (1) as low as is reasonably achievable planning or controls, (2) an overexposure, (3) a substantial potential for an overexposure, or (4) an impaired ability to assess dose. The primary cause of this finding was related to the cross-cutting area of Human Performance, subcategory personnel, in that the individuals failed to follow licensee procedures. (Section 20S1.2)

- Green. A finding of very low safety significance and a non-cited violation of Technical Specification 5.7.2 was self-revealed on March 31, 2005, when an operator working on a radiation work permit that did not permit entry into a locked high radiation area entered a posted locked high radiation area without having received the required radiation protection brief. The individual was tasked with performing a valve lineup on the N71 valve system in the turbine building catacombs. The N71 valve was located above a

permanent valve platform that was posted and controlled as a locked high radiation area. Adjacent to the platform was scaffolding which provided access to a condenser man-way. The proximity of the scaffolding made it possible to access the permanent platform from the scaffolding platform. The individual ascended the scaffold to its platform, and while crossing to the permanent platform, was able to perform the required valve observation. After completing the task he stepped onto the permanent valve platform and noted a locked high radiation area posting. He exited the permanent platform via the temporary scaffolding that he originally used to access the area. Corrective actions taken by the licensee included restricting the individual from the radiologically restricted area for several days, counseling and coaching by radiation protection and operations management, and the individual prepared a job briefing sheet for co-workers.

The finding was more than minor because the finding was associated with the human performance attribute of the occupational radiation safety cornerstone and affected the cornerstone objective of ensuring adequate protection of worker health and safety from exposure to radiation. The finding was of very low safety significance because it did not involve: (1) as low as is reasonably achievable planning or controls, (2) an overexposure, (3) a substantial potential for an overexposure, or (4) an impaired ability to assess dose. The primary cause of this finding was related to the cross-cutting area of Human Performance, subcategory personnel, in that the individual failed to follow licensee procedures. (Section 2OS1.2)

B. Licensee-Identified Violations

Three violations of very low safety significance, which were identified by the licensee, have been reviewed by the inspectors. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. These violations and corrective action tracking numbers are listed in Section 4OA7 of this report.

Report Details

Summary of Plant Status

The plant began the inspection period at 100 percent power and remained at 100 percent power until July 3, 2005, when power was reduced to 94 percent for scheduled turbine bypass valve testing. The unit returned to 100 percent power later the same day. On July 30, 2005, power was reduced to 70 percent for a scheduled control rod sequence exchange and turbine valve testing. The unit returned to 100 percent power on July 31, 2005. On August 14, 2005, power was reduced to 75 percent for a scheduled control rod sequence exchange. The unit returned to 100 percent power later the same day. On August 27, 2005, power was reduced to 85 percent for scheduled scram time testing. The unit returned to 100 percent power on August 28, 2005. On September 24, 2005, power was reduced to 94 percent for scheduled turbine valve testing. The unit returned to 100 percent power later that same day and remained at or near 100 percent power for the remainder of the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity and Emergency Preparedness

1R01 Adverse Weather Protection (71111.01)

a. Inspection Scope

During the week of September 5, 2005, the inspectors observed licensee activities associated with the treatment of raw water systems to control populations of zebra mussels. The inspectors observed infrequently performed test or evolution briefings, pre-shift briefings, and control room briefings to determine whether the briefings met criteria specified in the Perry Operations Section Expectations Handbook and Perry Administrative Procedure (PAP) 1121, "Conduct of Infrequently Performed Tests or Evolutions," Revision 2. The inspectors also reviewed prerequisites identified in licensee procedure PTI-GEN-P0024, "Mussel Treatment," Revision 7, to determine whether they were completed prior to the initiation of treatment on September 8, 2005. Finally, during the remainder of the inspection period, the inspectors periodically reviewed licensee activities and data collection as specified by licensee procedure PTI-GEN-P0023, "Mussel Monitoring," Revision 3, to determine whether mussel settlement was being properly monitored.

This review constituted one inspection sample.

e. Findings

No findings of significance were identified.

1R04 Equipment Alignment (71111.04)

.1 Semi-Annual Complete System Walkdown

a. Inspection Scope

The inspectors performed a complete walkdown of accessible portions of the standby liquid control (SLC) system to determine system operability and condition during the weeks of July 11, 2005, and July 25, 2005. The SLC system was selected due to its risk significance. The inspectors used valve lineup instructions (VLIs) and system drawings to accomplish the inspection.

The inspectors observed selected switch and valve positions, electrical power availability, system pressure and temperature indications, component labeling, and general material condition. The inspectors determined whether system conditions were consistent with licensee procedures and drawings. The inspectors also reviewed open system engineering issues as identified in the licensee's Quarterly System Health Report, outstanding maintenance work requests, and a sampling of licensee condition reports (CRs) to determine whether problems and issues were identified, and corrected, at an appropriate threshold. The documents used for the walkdown are listed in the attached List of Documents Reviewed.

This review constituted one inspection sample.

b. Findings

Introduction: The inspectors identified a finding of very low safety significance and a non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," when licensee personnel failed to promptly correct a condition adverse to quality. Specifically, the licensee identified and documented, on seven occasions from June 2002 through February 2005, boron accumulations on the SLC system storage tank heater flange, but failed to adequately address the issue.

Description: During the weeks of July 11, 2005, and July 25, 2005, the inspectors conducted a complete walkdown of accessible portions of the SLC system. Additionally, the inspectors reviewed open system engineering issues as identified in the licensee's Quarterly System Health Report, outstanding maintenance work requests, and a sampling of licensee CRs to determine whether problems and issues were identified and corrected at an appropriate threshold. While reviewing these documents, the inspectors noted that seven CRs, all classified as a condition adverse to quality, documented boron accumulation on the SLC storage tank heater flange and other 'A' SLC loop components. In particular, the inspectors noted the following:

- Licensee CR 02-02015, "Boron Residue on 1C41A001," dated June 24, 2002, documented boron residue at the flange connection between the SLC storage tank and the tank heater. A work order (WO) was generated to replace the flange gasket, but was subsequently rescheduled as an outage WO since draining the SLC storage tank while at power was not a viable option. The licensee subsequently

determined that draining the tank during an outage was “determined to be too much work for such an insignificant leak.” An engineering change request was submitted to install a permanent leak sealant device on the tank heater’s flange connection. The engineering change request was subsequently cancelled. The CR also documented that the condition was first identified on problem identification form 97-0765, dated May 6, 1997. Thus, the leakage issue was five years old at the time CR 02-02015 was generated.

- Licensee CR 02-02586, “Boron Leak Found on SLC Tank in Containment 642’,” dated August 4, 2002, documented “stalactite formation formed off the flange connection of the heater” and further identified “there appears to be several ounces of buildup.” The CR was closed with a reference to CR 02-02015.
- Licensee CR 03-02615, “Boron Residue in Containment,” dated April 29, 2003, documented a “large buildup of residue under the C41 tank heater and spreading around the base of the C41 tank and on the floor in the area of the C41 pumps” and further identified residue was “also evident on containment 620 on C11 accumulators directly under the C41 tank and valves.” A corrective action was generated to clean the area, which was completed May 18, 2005, and to generate a preventative maintenance task to inspect the system on a quarterly basis and initiate cleanup activities as required.
- Licensee CR 03-02689, “Boric Solution Leak in Containment,” dated April 30, 2003, identified essentially the same condition as CR 03-02615, but also documented that “this slow leak may have propagated to the containment 599’ level as there is evidence of white crystallization.”
- Licensee CR 03-04281, “C41 Tank Heater Leak,” dated July 17, 2003, documented “a pillar of solidified boron from the heater flange to the storage tank base plate.” The inspectors noted that this identification occurred within about two months of the last documented cleaning. A corrective action was generated to track completion of a WO for gasket replacement. The WO was initially scheduled for refueling outage (RFO) 10 in the spring of 2005, but was subsequently rescheduled with a due date of April 30, 2007.

Additionally, two CRs (05-00066 and 05-01128) were generated in January and February, respectively, of 2005 to document continued identification of boron accumulation on the heater flange. Licensee CR 05-01128 noted “large moist accumulation” at the heater flange.

The inspectors recognized that the slow leak did not present an immediate operability concern. The inspectors noted that because the storage tank was vented which limited pressure on the heater flange gasket, a rapid deterioration of the connection was not credible. The inspectors also recognized that the flange gasket could not be replaced at power due to Technical Specification (TS) requirements. The inspectors further noted that the solution was not acidic and therefore did not create a highly corrosive environment.

The inspectors could not, however, conclude that the licensee's actions to address this long-standing leakage issue was adequate. As of the end of the inspection period, the only corrective action implemented was the quarterly preventative maintenance task to inspect and clean as necessary. The inspectors noted that no action taken had corrected the actual condition adverse to quality, despite four RFO opportunities subsequent to condition discovery in 1997. The inspectors further questioned the licensee's monitoring of the leakage in that all responses to CRs referenced "one drop per day" as the leakage rate. The inspectors concluded that since the licensee was cleaning the flange on a quarterly basis, the large accumulations noted on numerous CRs as well as direct inspector observation did not correlate to one drop per day. In the absence of meaningful leakage data, the inspectors could not conclude that the condition was not degrading. The licensee entered the "untimely resolution of a condition adverse to quality" into their corrective action program and confirmed for the inspectors that the issue was included in RFO 11. The inspectors determined that the failure to correct a condition adverse to quality within eight years of identification was a performance deficiency.

Analysis: The inspectors determined that the failure to correct a condition adverse to quality within eight years of identification was a performance deficiency warranting a significance evaluation. The inspectors concluded that the finding was greater than minor in accordance with Inspection Manual Chapter (IMC) 0612, "Power Reactor Inspection Reports," Appendix B, "Issue Screening," dated May 19, 2005. The inspectors determined that the licensee's failure to remediate leakage on a safety-related system, a condition adverse to quality, was more than minor because if left uncorrected it would become a more significant safety concern. Specifically, the failure to repair the degraded flange connection allowed a condition to exist that could lead to increased leakage or premature failure of the connection. Further, as noted on multiple licensee CRs, the leakage had on occasion migrated to other levels of containment potentially impacting the availability of additional equipment. The primary cause of this finding was related to the cross-cutting area of Problem Identification and Resolution, subcategory corrective action, in that the condition adverse to quality was not promptly corrected.

The inspectors reviewed IMC 0609, Appendix A, "Determining the Significance of Reactor Inspection Findings for At-Power Situations," dated December 1, 2004. In accordance with the mitigating system cornerstone phase 1 screening criteria, the inspectors determined that the finding (1) did not involve a loss of safety function and (2) did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. The inspectors therefore concluded that the finding was of very low safety significance.

Enforcement: Appendix B of 10 CFR Part 50, Criterion XVI, "Corrective Actions," requires, in part, that measures be established to assure that conditions adverse to quality are promptly identified and corrected. Contrary to this requirement, licensee personnel failed to promptly correct a condition adverse to quality; specifically, boron solution leakage from the SLC storage tank heater flange, despite numerous opportunities to do so. The issue was clearly and repeatedly classified as a condition adverse to quality by the licensee and, therefore, the condition was required to be

corrected at the first reasonable opportunity. The inspectors concluded the condition adverse to quality dated back to at least 1997. Because of the very low safety significance and because the issue has been entered into the licensee's corrective action program (CR 05-05938), the issue is being treated as a non-cited violation (NCV) consistent with Section VI.A.1 of the NRC Enforcement Policy (**NCV 05000440/2005009-01**).

As part of the licensee's corrective actions, the licensee entered this issue into the corrective action program and created a work order to conduct appropriate repairs during RFO 11.

.2 Quarterly Partial System Walkdowns

a. Inspection Scope

The inspectors conducted partial walkdowns of the system trains listed below to determine whether the systems were correctly aligned to perform their designed safety function. The inspectors used licensee VLIs and system drawings during the walkdowns. The walkdowns included selected switch and valve position checks, and verification of electrical power to critical components. Finally, the inspectors evaluated other elements, such as material condition, housekeeping, and component labeling. The documents used for the walkdowns are listed in the attached List of Documents Reviewed. The inspectors reviewed the following systems:

- the reactor core isolation cooling (RCIC) system following system restoration after planned maintenance on August 11, 2005;
- the emergency closed cooling (ECC) 'A' system while the ECC 'B' system was inoperable due to a planned Division 2 outage on September 14, 2005;
- the Division 1 emergency diesel generator (EDG) while the Division 2 EDG was inoperable due to a planned Division 2 outage on September 14, 2005; and
- the emergency service water (ESW) 'B' system, following system restoration after a planned Division 2 outage on September 15, 2005.

These reviews constituted four inspection samples.

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05AQ)

a. Inspection Scope

The inspectors walked down the following areas to assess the overall readiness of fire protection equipment and barriers:

- Fire Zone CC-2, control complex elevation 599'-0";
- Fire Zone 0IB-1, intermediate building elevation 574';

- Fire Zone 1AB-2, Unit 1 auxiliary building elevation 599';
- Fire Zone 1AB-1G, Unit 1 auxiliary building corridor elevation 574'-10";
- Fire Zones 1AB-3A and 1AB-3B, Unit 1 auxiliary building elevation 620'-6";
- Fire Zone 0FH-3; fuel handling building elevation 620'-6";
- Fire Zone 0FH-2A; fuel handling building elevation 599' north;
- the turbine power complex; and
- the transformer yard areas.

Emphasis was placed on evaluating the licensee's control of transient combustibles and ignition sources, the material condition of fire protection equipment, and the material condition and operational status of fire barriers used to prevent fire damage or propagation. The inspectors utilized the general guidelines established in licensee procedures FPI-A-A02, "Periodic Fire Inspections," Revision 3; PAP-1910, "Fire Protection Program," Revision 11; and PAP-0204, "Housekeeping/Cleanliness Control Program," Revision 15; as well as basic National Fire Protection Association Codes, to perform the inspection and to determine whether the observed conditions were consistent with procedures and codes.

The inspectors observed fire hoses, sprinklers, and portable fire extinguishers to determine whether they were installed at their designated locations, were in satisfactory physical condition, and were unobstructed. The inspectors also evaluated the physical location and condition of fire detection devices. Additionally, passive features such as fire doors, fire dampers, and mechanical and electrical penetration seals were inspected to determine whether they were in good physical condition. The documents listed at the end of this report in the attached List of Documents Reviewed were used by the inspectors during the assessment of this area.

These reviews constituted nine inspection samples.

b. Findings

Introduction: The inspectors identified a finding of very low safety significance and a non-cited violation of 10 CFR 50, Appendix B, Criterion III, "Design Control," when licensee personnel erected a large storage cage that interfered with the design rattle space between the containment shield building and the intermediate building at several locations. The primary cause of this finding was the failure to properly control deviations from design standards.

Description: On July 22, 2005, while performing a fire protection inspection in the intermediate building, the inspectors noted that a large storage cage was constructed in such a way that it interfered with the design rattle space between the containment shield building and the intermediate building column supports at several locations. The cage structure was located on the lower level of the intermediate building and occupied about 50 feet of the intermediate building's interface with the Unit 1 shield building. The structure was of irregular shape and was about 900 square feet in area and 10 feet high. It was constructed of steel scaffold poles and brackets, metal fence, and metal shelving. The cage was braced in numerous locations squarely around several intermediate building column supports. Several of the affected columns were located in

close proximity to the shield building just outside the rattle space. Steel poles that were attached to these intermediate building columns bridged the short distance between the columns and the shield building, occupied the rattle space, and in several cases, contacted the shield building wall. Bracing poles and brackets extended out from the columns toward the shield building at three separate elevations along the height of the cage structure. Additionally, the cage was largely filled with stored material and miscellaneous equipment. The inspectors noted that some of this material also extended into the 3-inch rattle space.

The immediate concern of the inspectors was that the steel used to brace the cage directly communicated the containment shield building, which was part of the reactor building complex, to the columns that supported the intermediate building. The inspectors noted that, as described in the Updated Safety Analysis Report (USAR), Revision 13, the design seismic analysis of the building structures credited a rattle space in lieu of further analysis of the interaction between building structures. Specifically, USAR Section 3.8, "Design of Category I Structures," Subsection 3.8.0.2, "Other Safety Class Structures," stated, "The Reactor Building Complex and the other safety class structures are separated from each other to preclude interaction between the structures." Furthermore, USAR Section 3.8.4.1, "Description of Structures," stated that certain safety class structures, including the intermediate building, were separated from the reactor building and each other by a 3-inch rattle space above the foundations. Because the rattle space was designed to preclude building interaction and because the storage structure clearly provided a path for interaction between the buildings, the inspectors concluded that the interference of the rattle space was not consistent with the design basis. The inspectors reported the condition to the licensee. The licensee dispatched a maintenance team and an engineering representative to assess the situation and then performed work to correct the condition.

The inspectors discussed the issue with licensee engineers. The inspectors determined that the cage had been designed and constructed without engineering evaluation or calculation that considered the impact of the structure on the safety class buildings. Licensee structural engineers subsequently performed an analysis to determine whether the rattle space interference had created a condition that prevented the buildings from performing their design function. The licensee examined the load combinations that the various structures would experience during a design basis event as a result of the communication between the buildings. The licensee ultimately determined that the cage structural components would fail prior to causing the intermediate building column design capacities to be exceeded. The inspectors reviewed the analysis and concluded that the safety function of the building structures was maintained.

On several other occasions during the inspection period, the inspectors noted design control issues associated with unevaluated conditions of material stored in the rattle space. Additionally, the inspectors noted that the licensee had constructed numerous storage locations within safety class buildings. The inspectors observed on several occasions that material storage expanded beyond the boundaries established by engineering evaluation. In some cases, unsecured scaffolding components were noted to be outside established boundaries, standing erect, and in close proximity to safety-related equipment. Therefore, the inspectors concluded that the issue of design

control was not limited to the rattle space interference as described in the foregoing paragraphs.

The inspectors determined that the licensee's failure to evaluate and control the design of a cage structure that affected the design rattle space function between safety class buildings was a performance deficiency.

Analysis: The inspectors determined that the licensee's failure to evaluate and control the design of a cage structure that affected the design rattle space function between safety class buildings was a performance deficiency warranting a significance evaluation. The inspectors concluded that the finding was greater than minor in accordance with IMC 0612, "Power Reactor Inspection Reports," Appendix B, "Issue Screening," dated May 19, 2005. Specifically, the finding was associated with the mitigating system cornerstone attribute of design control and affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences since it placed safety class building structures in an unanalyzed condition. The inspectors reviewed IMC 0609, Appendix A, "Determining the Significance of Reactor Inspection Findings for At-Power Situations," dated December 1, 2004. The inspectors concluded that the safety functions of the buildings were maintained and therefore determined that the finding was of very low safety significance.

Enforcement: Appendix B of 10 CFR 50, Criterion III, "Design Control," required that measures shall be established to assure that applicable regulatory requirements and the design basis are correctly translated into specifications, drawings, procedures, and instructions. Contrary to this requirement, the licensee failed to evaluate the design of a large storage cage structure and erected it in such a way that it interfered with the design rattle space between safety class buildings. This resulted in an unanalyzed condition where the shield building was in direct communication with the column supports for the intermediate building. The condition was identified by inspectors on July 22, 2005, and was corrected by the licensee on the same day. The initial date that the interfering structure was built was not identified by the licensee. Because of the very low safety significance and because the issue has been entered into the licensee's corrective action program (CR 05-05898), the issue is being treated as an NCV consistent with Section VI.A.1 of the NRC Enforcement Policy.

(NCV 05000440/2005009-02)

As part of the licensee's immediate corrective actions, structural engineers performed an engineering analysis which determined that the buildings remained capable of performing their design function.

1R06 Flood Protection Measures (71111.06)

The following reviews constituted two inspection samples.

.1 Internal Flooding - Equipment Hatches

a. Inspection Scope

The inspectors performed an inspection of internal flooding vulnerabilities associated with spray-down of safety-related equipment due to unsealed equipment hatch floor plugs or blocked floor drains. The inspection consisted of a review of the internal flooding design features described in the USAR and the licensee's assessment of the emergency core cooling system (ECCS) rooms and the associated hatch floor plugs. The inspectors walked down the hatch floor plugs, floor drains and the ECCS rooms to determine whether the equipment was consistent with design.

This review constituted the first of two samples for this inspection procedure.

b. Findings

No findings of significance were identified.

.2 External Flooding - Facility Roofs

a. Inspection Scope

The inspectors performed an inspection of external flooding and water intrusion vulnerabilities associated with facility roofs. The inspectors conducted walkdowns of selected roofs to observe the condition of the roofs and roof drains to determine whether the observations were consistent with licensee building design and licensee maintenance procedures. The inspectors reviewed licensee corrective action documents to determine whether previously identified deficiencies were appropriately prioritized for remediation. Finally, the inspectors reviewed the licensee's 10 CFR 50.65(a)(1) action plan for safety-related and nonsafety-related class structures to determine whether licensee actions and performance monitoring were appropriate.

This review constituted the second of two samples for this inspection procedure.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification (71111.11)

a. Inspection Scope

On July 25, 2005, the resident inspectors observed licensed operator performance in the plant simulator. The inspectors evaluated crew performance in the areas of:

- clarity and formality of communication;
- ability to take timely action in the safe direction;
- prioritizing, interpreting, and verifying alarms;
- correct use and implementation of procedures, including alarm response procedures;
- timely control board operation and manipulation, including high-risk operator actions; and,
- group dynamics.

The inspectors also observed the licensee's evaluation of crew performance to determine whether the training staff had observed important performance deficiencies and specified appropriate remedial actions.

This review constituted one inspection sample.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness (71111.12)

a. Inspection Scope

The inspectors reviewed the licensee's implementation of the maintenance rule requirements to determine whether component and equipment failures were identified and scoped within the maintenance rule and that select structures, systems, and components (SSCs) were properly categorized and classified as (a)(1) or (a)(2) in accordance with 10 CFR 50.65. The inspectors reviewed station logs, maintenance WOs, selected surveillance test procedures, and a sample of CRs to determine whether the licensee was identifying issues related to the maintenance rule at an appropriate threshold and that corrective actions were appropriate. Additionally, the inspectors reviewed the licensee's performance criteria to determine whether the criteria adequately monitored equipment performance and to determine whether licensee changes to performance criteria were reflected in the licensee's probabilistic risk assessment. During this inspection period, the inspectors reviewed the following SSCs:

- fire protection system;
- instrument and service air systems; and
- high pressure core spray system.

These reviews constituted three inspection samples.

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13)

a. Inspection Scope

The inspectors reviewed the licensee's evaluation of plant risk, scheduling, configuration control, and performance of maintenance associated with planned and emergent work activities to determine whether scheduled and emergent work activities were adequately managed in accordance with 10 CFR 50.65(a)(4). In particular, the inspectors reviewed the licensee's program for conducting maintenance risk assessments to determine whether the licensee's planning, risk management tools, and the assessment and management of on-line risk were adequate. The inspectors also reviewed licensee actions to address increased on-line risk when equipment was out of service for maintenance, such as establishing compensatory actions, minimizing the duration of the activity, obtaining appropriate management approval, and informing appropriate plant staff, to determine whether the actions were accomplished when on-line risk was increased due to maintenance on risk-significant SSCs. The following assessments and/or activities were reviewed:

- the licensee's response to extreme hot weather conditions and conversion economic's declaration of an "orange" grid status during the week of July 25, 2005;
- the licensee's risk assessment and control of a RCIC maintenance outage during the week of August 8, 2005;
- the licensee's management of numerous emergent high priority work activities including, but not limited to, emergent work associated with a reactor water cleanup (RWCU) system leak and emergent work associated with the service water discharge strainers during the week of August 14, 2005; and
- the licensee's maintenance risk assessment and work execution associated with a Division 2 outage during the week of September 12, 2005.

These reviews constituted four inspection samples.

b. Findings

No findings of significance were identified.

1R14 Operator Performance During Non-Routine Evolutions and Events (71111.14)

The following reviews constituted two inspection samples.

.1 Main Turbine Lube Oil Cooler Fouling

a. Inspection Scope

On July 1, 2005, the licensee identified reduced performance of the 'B' main turbine lube oil heat exchanger. Later that same day, the licensee prepared for and executed a swap of the main turbine lube oil heat exchangers from 'B' to 'A.' On July 25, 2005, the licensee subsequently identified reduced performance of the 'A' heat exchanger. Having completed inspection and cleaning of the 'B' heat exchanger, the licensee

swapped back to the 'B' heat exchanger on July 26, 2005, and initiated action to clean and inspect the 'A' heat exchanger.

Due to the increased risk of the initiation of a transient event, the inspectors observed both heat exchanger swaps to determine whether procedure use, crew communications, and coordination of activities between work groups similarly met established station expectations and standards.

This review constituted the first of two samples for this inspection procedure.

b. Findings

No findings of significance were identified.

.2 Reactor Water Cleanup (RWCU) Automatic Isolation and Non-Regenerative Heat Exchanger Vessel Flange Leak

a. Inspection Scope

The inspectors reviewed the licensee's response to an automatic RWCU isolation due to high valve nest room temperatures on August 12, 2005. The inspectors reviewed the licensee's immediate and supplemental actions to determine whether they were consistent with actions specified in licensee procedures ARI-H13-P680-0001, "Reactor Water Cleanup," Revision 7 and SOI-G33, "Reactor Water Cleanup System," Revision 21. The inspectors also reviewed the series of events preceding the automatic isolation and a non-regenerative heat exchanger vessel flange leak to determine if applicable requirements of 10 CFR Part 50, Appendix B were met.

This review constituted the second of two samples for this inspection procedure.

b. Findings

Introduction: A finding of very low safety significance and a non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," was self-revealed on August 12, 2005, when licensee personnel failed to promptly correct a condition adverse to quality. Specifically, on July 2, 2005, the licensee identified that the RWCU system valve nest room had elevated temperatures. Licensee corrective actions were ineffective and resulted in system manipulations which induced a RWCU system leak and failed to prevent an automatic RWCU system isolation.

Description: On July 2, 2005, the licensee identified elevated temperatures in the RWCU system valve nest room. The licensee assembled a problem solving team to investigate why thermocouple 1E31N0043B was indicating higher values than expected and why it was not consistent with other room temperature indications. Several potential causes were initially identified including temperature sensor calibration, ventilation problems, and steam leaks. The licensee's immediate actions, as documented in CR 05-05156, "RWCU System Valve Nest Room Has Elevated Temperatures," dated July 2, 2005, included room entry to search for leaks and obtain local temperature

readings. No leakage was identified and the highest identified temperature was 17°F less than the temperature indicated by 1E31N0043B. The licensee did note limited air flow in the area of the thermocouple as well as “marginally effective pipe insulation.” A small packing leak on a check valve was later identified. The thermocouple was subsequently determined to be in calibration and functioning properly. An engineering change package was initiated to relocate the thermocouple to a location more representative of average room temperature.

As the engineering change package was being developed, interim engineering guidance was provided to operations to start the RCIC room cooler at 133°F and to secure a RWCU pump at 134°F. The inspectors noted that the setpoint for RWCU system isolation was 135°F. On August 4, 2005, room temperature as indicated by the non-representative thermocouple reached 134°F and the ‘B’ RWCU pump was secured. On August 12, 2005, room temperature again reached 134°F and the ‘B’ RWCU pump was again secured, however an automatic isolation occurred about one minute later. On August 19, 2005, plant operators noted a small increase in RWCU differential flow indicative of a system leak. Licensee personnel entered the RWCU heat exchanger room and identified a 1 gallon per minute leak on a non-regenerative heat exchanger vessel flange. The licensee’s review of computer data revealed that the leak most likely was initiated on August 4, 2005; coincident with the system manipulations that had been implemented as recommended by the engineering staff.

The RWCU system was placed back in service on August 12, 2005, the thermocouple was relocated on August 14, 2005, and the heat exchanger vessel flange leak was repaired on September 6, 2005, at a dose of about 4 person-rem. The inspectors determined that the untimely corrective action and ineffective interim actions that led to an automatic engineered safety feature (ESF) actuation and system leak was a performance deficiency.

Analysis: The inspectors determined that the untimely corrective action and ineffective interim actions that led to the automatic RWCU ESF actuation and system leak was a performance deficiency warranting a significance evaluation. The inspectors determined that the issue was more than minor because it could reasonably be viewed as a precursor to a more significant event. Specifically, the inability of the licensee’s problem solving team to prescribe effective interim measures and timely corrective action could, in other scenarios such as increased main steam tunnel temperatures during hot weather, have had more significant consequences. The finding was associated with the cross-cutting area of Problem Identification and Resolution, subcategory corrective action, because corrective actions were not timely and interim actions were ineffective.

Using IMC 0609, Appendix A, “Significance Determination of Reactor Inspection Findings for At-Power Situations,” dated December 1, 2004, the inspectors reviewed the finding against the Phase 1 Screening Worksheet for the Initiating Events Cornerstone. The inspectors determined that the finding: (1) did not contribute to the likelihood of a

loss-of-coolant-accident initiator; (2) did not contribute to both the likelihood of a reactor trip and the likelihood that mitigation equipment or functions would not be available; and (3) did not increase the likelihood of a fire or internal/external flood. The inspectors therefore concluded that the finding was of very low safety significance.

Enforcement: Appendix B, Criterion XVI, "Corrective Action," of 10 CFR Part 50 requires, in part, that measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and non-conformances are promptly identified and corrected. Contrary to these requirements, the improper placement of thermocouple 1E31N0043B was not promptly corrected. The condition adverse to quality was first identified on July 2, 2005, but was not corrected until August 14, 2005. As a result, the untimely corrective action and ineffective interim actions led to an automatic engineered safety feature actuation and system leak. Because of the very low safety significance and because the issue has been entered into the licensee's corrective action program (CR 05-06016), the issue is being treated as an NCV consistent with Section VI.A.1 of the NRC Enforcement Policy. **(NCV 05000440/2005009-03)**

As part of the licensee's immediate corrective actions, the thermocouple was re-located to an area more representative of actual average room temperature.

1R15 Operability Evaluations (71111.15)

a. Inspection Scope

The inspectors selected CRs related to potential operability issues for risk-significant components and systems. These CRs were evaluated to determine whether the operability of the components and systems was justified. The inspectors compared the operability and design criteria in the appropriate sections of the TS and USAR to the licensee's evaluations to determine whether the components or systems were operable. Where compensatory measures were required to maintain operability, the inspectors determined whether the measures were in place, would function as intended, and were properly controlled. Additionally, the inspectors determined, where appropriate, compliance with bounding limitations associated with the evaluations. The inspectors reviewed the following issues:

- the licensee's conclusions regarding the operability of the diesel driven fire pump after the failure of a manual start function on June 24, 2005;
- the licensee's operability determination associated with the EDG exhaust corridor concrete patch that was not reworked prior to installation of a missile shield modification on July 26, 2005;
- the licensee's operability determination associated with residual heat removal (RHR) safety relief valves applied to water service instead of steam service, reviewed on August 31, 2005;
- the licensee's operability determination associated with a valve stem lubrication change affecting an RHR 'A' motor-operated valve on September 13, 2005; and

- the licensee's assessment of the impact of the surveillance failure and subsequent inoperability of the RHR 'B' heat exchanger ESW outlet valve, 1P45-F068B, on ESW operability.

These reviews constituted five inspection samples.

b. Findings

No findings of significance were identified.

1R16 Operator Workarounds (71111.16)

a. Inspection Scope

The inspectors assessed the following operator workaround issues to determine the potential effects on the functionality of the corresponding mitigating systems:

- the additional requirements imposed on operations personnel due to failures of the Division 1 and 2 EDG jacket water temperature switches;
- the impact on operations personnel due to the need to vent the jockey fire pump pressure switch every third day;
- the impact on operations personnel due to the need to open the RCIC pump room sump cubicle drain daily due to leakage from the RWCU valve nest room; and
- the impact on plant operations personnel due to the frequent cycling of control rod drive mechanism high temperature alarms.

During these inspections, the inspectors reviewed the technical adequacy of the workaround documentation against the USAR and other design information to assess whether the workaround conflicted with any design basis information. The inspectors also compared the information in off-normal or emergency operating procedures to the workaround information to ensure that the operators maintained the ability to implement important procedures when required. Lastly, the inspectors conducted a review of recent CRs to ensure that operator workaround related issues were entered into the corrective action program when required.

These reviews constituted four inspection samples.

b. Findings

No findings of significance were identified.

1R19 Post-Maintenance Testing (71111.19)

a. Inspection Scope

The inspectors evaluated the following post-maintenance testing (PMT) activities for risk-significant systems to assess the following (as applicable): the effect of testing on the plant had been adequately addressed; testing was adequate for the maintenance

performed; acceptance criteria were clear and demonstrated operational readiness; test instrumentation was appropriate; tests were performed as written; and equipment was returned to operational status following testing. The inspectors evaluated the activities against TS, the USAR, 10 CFR Part 50 requirements, licensee procedures, and various NRC generic communications. In addition, the inspectors reviewed CRs associated with PMT to determine whether the licensee was identifying problems and entering them in the corrective action program. The specific procedures and CRs reviewed are listed in the attached List of Documents Reviewed. The following post-maintenance testing activities were reviewed:

- testing of the diesel fire pump following start switch replacement on July 12, 2005;
- testing of the RCIC condensate storage suction check valve, 1E51-F011, following valve replacement on August 11, 2005;
- testing of the lower containment personnel airlock conducted on August 18, 2005, and August 19, 2005;
- testing of the RHR 'B' pump breaker following maintenance on September 14, 2005;
- testing of the emergency core cooling (ECC) 'B' pump following maintenance on September 14, 2005; and
- testing of the Division 2 EDG fuel oil system associated with the replacement of a cylinder fuel line on September 15, 2005

These reviews constituted six inspection samples.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors observed surveillance testing or reviewed test data for risk-significant systems or components to assess compliance with TS; 10 CFR Part 50, Appendix B; and licensee procedure requirements. The testing was also evaluated for consistency with the USAR. The inspectors verified that the testing demonstrated that the systems were ready to perform their intended safety functions. The inspectors reviewed whether test control was properly coordinated with the control room and performed in the sequence specified in the surveillance instruction (SVI), and if test equipment was properly calibrated and installed to support the surveillance tests. The procedures reviewed are listed in the attached List of Documents Reviewed. The surveillance activities assessed were:

- RHR 'B' pump and valve quarterly surveillance performed on June 26, 2005;
- SLC 'A' pump and valve quarterly surveillance performed on August 8, 2005;
- ESW 'A' pump and valve quarterly surveillance performed on August 9, 2005;
- main steam line high flow channel 'A' leak detection surveillance performed on August 1, 2005; and

- Division 2 remote shutdown panel 24-month surveillance performed on September 15, 2005.

These reviews constituted five inspection samples.

b. Findings

Introduction: A finding of very low safety significance and a non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," was self-revealed when the RHR 'B' isolation valve for containment spray (CS), 1E12F028B, failed to indicate open in the control room as expected during quarterly surveillance testing on June 25, 2005. The licensee had performed a valve motor replacement in March of 2005 and entered the valve's electrical panel on numerous occasions to perform work. The licensee failed to identify, despite multiple opportunities, a visibly askew connection and a loose electrical connection during the performance of work in the affected electrical panel, during post-maintenance inspection of the work, and during post-maintenance testing of the valve.

Description: On June 25, 2005, operators were conducting surveillance testing in accordance with SVI-E12T2002, "RHR B Pump and Valve Operability Test," Revision 20. This procedure instructed operators to exercise 1E12F028B open and closed, to verify valve position indication, and to record stroke time. When operators took the valve switch for 1E12F028B to open, the red (open) indicating light in the control room did not illuminate as expected. Observers at the valve location and at the electrical panel, EF1D07-R, reported that the valve appeared to stroke normally.

Operators declared 1E12F028B inoperable because it did not meet the test acceptance criteria and entered several TS action statements. Operators closed 1E12F028B and locally verified that the valve was closed. Because 1E12F028B was a containment isolation valve, the action statements included isolation of the affected penetration flow path within four hours. Therefore, operators also closed and de-energized 1E12F027B, the associated penetration isolation valve for 1E12F028B, to isolate the penetration flow path. This action rendered both low pressure coolant injection (LPCI) and CS functions of RHR 'B' unavailable.

Licensee technicians obtained voltage readings in EF1D07-R and found symptoms of a bad connection. The physical examination of EF1D07-R revealed that a removable terminal block was slightly askew and that another connection was loose. Technicians repaired the improper connections and operators re-tested the valve with satisfactory results. RHR 'B' was restored to a normal line-up and LPCI and CS functions of RHR 'B' were declared available. The total unavailability time due to the penetration isolation was about nine hours.

The inspectors discussed the maintenance history of valve 1E12F028B with the system engineer. The system engineer stated that the valve had last been worked in March of 2005 for a motor replacement. The inspectors reviewed the associated work package documentation and noted that work was conducted inside the EF1D07-R panel. The inspectors noted that EF1D07-R was entered for work on numerous occasions by

multiple personnel. The inspectors noted that the work package associated with the post-maintenance testing of the valve also required work in EF1D07-R which included the landing of electrical connections. The inspectors noted the absence of documentation in the post-maintenance test work package to indicate performance of a post-electrical work checklist or inspection.

The inspectors noted that the licensee program specifically intended to identify this problem, the post-maintenance inspection and testing for the motor replacement work, did not reveal the improper connections in EF1D07-R. Because the June 26, 2005, inspection of EFD1D07-R readily revealed symptoms of inadequate connections and resulted in observations of an askew and a loose connection, the inspectors determined that the licensee had reasonable opportunity to detect the condition before returning the valve to service after the motor replacement maintenance. The inspectors determined that this failure to promptly identify and correct this condition adverse to quality was a performance deficiency.

Analysis: The inspectors determined that failure to promptly identify and correct a condition adverse to quality during maintenance on 1E12F028B in March 2005, and during the subsequent inspection and post-maintenance testing on the valve, was a performance deficiency warranting a significance evaluation. The inspectors concluded that the finding was greater than minor in accordance with IMC 0612, Appendix B, "Issue Screening," dated May 19, 2005, since the finding was associated with the mitigating systems cornerstone attribute of equipment performance and affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable events. Specifically, the failure to promptly identify and correct a condition adverse to quality resulted in the return of a valve to service with inadequate electrical connections that affected the valve indication in the control room on June 25, 2005. This resulted in a failed surveillance test that led to isolation of the penetration flow path associated with the valve and the subsequent unavailability of the RHR 'B' LPCI and CS modes of operation. The finding was associated with the cross-cutting area of Problem Identification and Resolution, subcategory identification, because licensee personnel failed to promptly identify and correct the inadequate electrical connections despite multiple opportunities.

Using IMC 0609, Appendix A, "Significance Determination of Reactor Inspection Findings for At-Power Situations," dated December 1, 2004, the inspectors reviewed the finding against the Phase 1 Screening Worksheet affecting the Mitigating Systems Cornerstone. The inspectors determined that the finding was associated with an actual loss of safety function of a single train of CS and LPCI; however, the inspectors also determined that the safety functions were not lost for greater than the TS allowed outage time. Therefore, the inspectors concluded the finding was of very low safety significance.

Enforcement: Appendix B, Criterion XVI, "Corrective Action," of 10 CFR Part 50 requires, in part, that measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and non-conformances are promptly identified and corrected. Contrary to these requirements, during maintenance and testing that affected the electrical panel for 1E12F028B, conducted from March 3 through March 8, 2005, the licensee failed to

promptly identify and correct inadequate electrical connections. As a result, on June 25, 2005, the inadequate electrical connections resulted in 1E12F028B inoperability and the unavailability of the RHR 'B' LPCI and CS functions for about nine hours. Because of the very low safety significance and because the issue was entered into the licensee's corrective action program (CR 05-05024 and CR 05-06532), the issue is being treated as an NCV consistent with Section VI.A.1 of the NRC Enforcement Policy.

(NCV 05000440/2005009-04)

As part of the licensee's immediate corrective actions, technicians repaired the improper connections and operators re-tested the valve with satisfactory results.

1R23 Temporary Plant Modifications (71111.23)

a. Inspection Scope

The inspectors reviewed documentation for the temporary configuration change associated with installing a clamp on a leaking RWCU system flange on September 6, 2005.

The inspectors assessed the acceptability of the temporary configuration change by comparing the 10 CFR 50.59 screening and evaluation information against the design basis, the USAR and the TS as applicable. The comparisons were performed to ensure that the new configuration remained consistent with design basis information. The inspectors monitored installation activities, including mock-up training, to ensure that the modification was installed as directed; the modification operated as expected; modification testing adequately demonstrated continued system operability, availability, and reliability; and that operation of the modification did not impact the operability of any interfacing systems. The inspectors also reviewed CRs initiated during or following the temporary modification installation to ensure that problems encountered during the installation were appropriately resolved.

This review constituted one inspection sample.

b. Findings

No findings of significance were identified.

1EP6 Drill Evaluation (71114.06)

a. Inspection Scope

The inspectors observed activities in the simulator control room, the technical support center, the emergency operations facility, and operations support center during an emergency preparedness drill conducted on July 19, 2005. The inspection focused on the ability of the licensee to appropriately classify emergency conditions, complete timely notifications, and implement appropriate protective action recommendations in accordance with approved procedures.

This review constituted one inspection sample.

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY

Cornerstone: Occupational Radiation Safety

2OS1 Access Control to Radiologically Significant Areas (71121.01)

.1 Plant Walkdowns and Radiation Work Permit Reviews

a. Inspection Scope

The inspectors reviewed the licensee's physical and programmatic controls for highly activated and/or contaminated materials (non-fuel) stored within the spent fuel pool.

This review represented one sample.

b. Findings

No findings of significance were identified.

.2 Problem Identification and Resolution

a. Inspection Scope

Corrective action reports related to access controls and high radiation area (HRA) radiological incidents (non-performance indicator occurrences identified by the licensee in HRAs less than 1 Rem/hr) were reviewed. Staff members were interviewed and corrective action documents were reviewed to determine if follow-up activities were being conducted in an effective and timely manner commensurate with their importance to safety and risk based on the following:

- Initial problem identification, characterization, and tracking;
- Disposition of operability/reportability issues;
- Evaluation of safety significance/risk and priority for resolution;
- Identification of repetitive problems;
- Identification of contributing causes;
- Identification and implementation of effective corrective actions;
- Resolution of NCVs tracked in the corrective action system; and
- Implementation/consideration of risk-significant operational experience feedback.

This sample was credited in Inspection Report 05000440/2005002.

b. Findings

- .1 Introduction: A finding of very low safety significance and a non-cited violation of TS 5.7.1 was self-revealed when, in two separate instances, contractor radiation workers were found inside posted HRAs without being signed on the appropriate radiation work permits (RWPs) for these areas. In the first instance, a contractor supervisor was observed inside a posted HRA/contaminated area without the required protective clothing. The individual was determined to be on a low risk RWP for heater bay work and had received the briefing for this work area. The individual did not receive the required HRA briefing for the turbine condenser bay area (a posted HRA) and was not on the required higher risk RWP.

In the second instance, a radiation protection technician (RPT) discovered two contractor radiation workers, that were signed on a low risk RWP for work in the turbine heater bay, in a HRA and had not received the required HRA briefing for the area.

Example 1:

Description: On January 10, 2005, a contractor supervisor was performing job observations in the heater bay, a radiation area, on RWP 055100. The individual received information that a work crew in the turbine building condenser bay, an HRA/contaminated area, had lost power and was unable to connect its welding equipment to perform the assigned task. The supervisor finished his observations in the heater bay and attempted to contact the work crew in the turbine building condenser bay. After several unsuccessful attempts to reach the work crew, the individual concerned about the work crew proceeded to the dress out area, donned shoe covers and gloves, and proceeded to the work crew area. When the supervisor entered the turbine building condenser bay, he failed to ensure that he was on the appropriate RWP (055200) and failed to receive the required radiation protection (RP) briefing for entry into an HRA/contaminated area.

Example 2:

Description: On March 8, 2005, two contractor radiation workers from the motor operated valve group entered an HRA in the RHR heat exchanger room on low risk RWP 056132. The workers were to move rigging from valve 1E12F005 to valve 1EF027A located in the same room. An RPT was present in the room and was questioned by the radiation workers as to why the area was an HRA. The RPT explained the location of the highest dose rate and told them the dose rate of the valve they were assigned to repair (1E12-F027A). As the RPT was leaving the area he heard one of the radiation worker's electronic dosimeters alarming and noted that they were across the cubicle near valve 1E12-F052A, which was the high dose rate valve that had been previously identified to them. The workers failed to sign off of the low risk RWP and to sign onto the medium risk RWP and did not obtain an RP brief prior to entry into this room.

Analysis: In both examples, the inspectors determined that the individuals failed to adhere to required basic radiation worker practices in that they did not ensure that they were on the appropriate RWP, did not receive the required briefing by RP for entry into an HRA, and did not adhere to postings. Basic radiation worker practices are described in licensee radiation worker training (FENOC Radiation Worker Training, Revision 1; and Plant Access Training, Revision 2) that is required of all workers entering the radiologically restricted area. This was determined to be a performance deficiency that warranted significance evaluation. The inspectors concluded that the finding was greater than minor in accordance with IMC 0612 "Power Reactor Inspection Reports," Appendix B, "Issue Disposition Screening," dated May 19, 2005. The inspectors determined that the failure of the individuals to use the appropriate RWP and adhere to its requirements was more than minor because the finding was associated with the human performance attribute of the occupational radiation safety cornerstone and affected the cornerstone objective of ensuring adequate protection of worker health and safety from exposure to radiation. The primary cause of this finding was related to the cross-cutting area of Human Performance, subcategory personnel, in that the individuals failed to follow licensee procedures.

Since the finding involved radiological access control issues and the unauthorized entry into HRAs, the inspectors utilized IMC 0609, Appendix C, "Occupational Radiation Safety SDP," to assess its significance. The inspectors determined that the finding did not involve "as low as is reasonably achievable" (ALARA) or work controls. The highest dose received by an individual for the entries was 2 millirem and thus there was no overexposure or substantial potential for an overexposure, nor was the licensee's ability to assess worker dose compromised. Consequently, the inspectors concluded that the finding was of very low safety significance

Enforcement: Technical Specification 5.7.1 required, in part, that entrance to an HRA be controlled by issuance of an RWP. The RWPs involved, (055200 and 056132) contained the requirement that individuals entering an HRA receive a briefing prior to entry. Contrary to these requirements, on January 10, 2005, and on March 8, 2005, contractor radiation workers including one supervisor entered posted HRAs on incorrect RWPs and failed to obtain the required briefings. Since the licensee documented this issue in its corrective action program (CR 05-0222 and 05-01959) and because the issue is of very low safety significance, it is being treated as a NCV consistent with Section VI.A.1 of the NRC Enforcement Policy. **(NCV 05000440/2005009-05)**

Corrective actions taken by the licensee included restricting the individuals from the radiologically restricted area. The supervisor involved in example 1 has taken ownership of this issue and worked with maintenance to identify a corrective action to help minimize the potential for reoccurrence. The contractor radiation workers in example 2 were counseled by RP to self-check the RWP and associated task level for the radiological conditions they would be exposed to.

.2 Introduction: A finding of very low safety significance and a non-cited violation of TS 5.7.2 was self-revealed when an operator working on an RWP that did not permit entry into a locked high radiation area (LHRA) entered a posted LHRA. The individual was working on an RWP that did not permit access to an LHRA and had not received the required RP brief prior to entering the LHRA.

Description: On March 31, 2005, an individual was tasked with performing a valve lineup on the N71 valve system. A pre-job operational (non-RP) brief was conducted by this individual along with two licensed reactor operators and two non-licensed operators. The work location was in the turbine building catacombs. The N71 valve was located above a permanent valve platform that was posted and controlled as an LHRA with an access ladder which was locked and posted. Adjacent to the platform was scaffolding which provided access to a condenser man-way. The proximity of the scaffolding made it possible to access the permanent platform from the scaffolding platform. The dose rates on the permanent valve platform did not require that the area be controlled as an LHRA, but the licensee had chosen to conservatively control the area as such.

The individual ascended the scaffold to its platform and while crossing to the permanent platform was able to perform the required valve observation. After completing the task he stepped onto the permanent valve platform and noted an LHRA posting. He exited the permanent platform via the temporary scaffolding that he originally used to access the area. Since the dose rates in the posted LHRA did not meet the criteria for posting as an LHRA but did meet the conditions for an HRA, the area was down posted to an HRA.

Analysis: The inspectors determined that the individual failed to adhere to the RWP requirements in that he entered a posted LHRA on an RWP that did not permit this activity and had not been briefed on conditions inside the LHRA. This was determined to be a performance deficiency that warranted a significance evaluation. The inspectors concluded that the finding was greater than minor in accordance with IMC 0612 "Power Reactor Inspection Reports," Appendix B, "Issue Disposition Screening," dated May 19, 2005. The inspectors determined that the failure of the individual to use the appropriate RWP and adhere to its requirements was more than minor because the finding was associated with the human performance attribute of the occupational radiation safety cornerstone and affected the cornerstone objective of ensuring adequate protection of worker health and safety from exposure to radiation. The primary cause of this finding was related to the cross-cutting area of Human Performance, subcategory personnel, in that the individual failed to follow licensee procedures.

Since the finding involved a radiological access control issue and the unauthorized entry into an LHRA, the inspectors utilized IMC 0609, Appendix C, "Occupational Radiation Safety SDP," to assess its significance. The inspectors determined that the finding did not involve ALARA or work controls. The dose received by the individual for the entry was 1 millirem and thus there was no overexposure or substantial potential for an overexposure, nor was the licensee's ability to assess worker dose compromised. Consequently the inspectors concluded that the finding was of very low safety significance.

Enforcement: Technical Specification 5.7.1 and 5.7.2 required, in part, that entrance to an HRA or LHRA be controlled by issuance of an RWP. Contrary to this requirement, on March 31, 2005, an individual entered a posted LHRA in the turbine building catacombs on an RWP that did not permit access to an LHRA. Since the licensee documented this issue in its corrective action program (CR 05-02921) and because the finding is of very low safety significance, it is being treated as a NCV consistent with Section VI.A.1 of the NRC Enforcement Policy. **(NCV 05000440/2005009-06)**

Corrective actions taken by the licensee included restricting the individual from the radiologically restricted area for several days, counseling and coaching by RP and operations management, and the individual prepared a job briefing sheet for co-workers.

2OS2 As Low As Is Reasonably Achievable (ALARA) Planning And Controls (71121.02)

.1 Radiological Work Planning.

a. Inspection Scope

The inspectors evaluated the licensee's ALARA planning for selected work activities and compared the results achieved, including dose rate reductions and person-rem used, with the estimated dose. Reasons for inconsistencies between intended and actual work activity doses were reviewed.

This review represented one inspection sample.

The interfaces between operations, RP, maintenance, scheduling and engineering groups were evaluated to identify interface problems or missing program elements.

This review represented one inspection sample.

The integration of ALARA requirements into work procedures and RWP documents was evaluated to determine that the licensee's radiological job planning would reduce dose.

This review represented one inspection sample.

The inspectors compared the person-hour estimates, provided by work planning and other groups to the RP group, with the actual work activity time required in order to evaluate the accuracy of these time estimates.

This review represented one inspection sample.

The licensee's post-job (work activity) reviews were evaluated to determine if identified problems were entered into the licensee's corrective action program.

This review represented one inspection sample.

b. Findings

No findings of significance were identified.

.2 Source-Term Reduction and Control

a. Inspection Scope

The inspectors reviewed licensee records to identify the historical trends and current status of tracked plant source terms and determine whether the licensee was making allowances and had developed contingency plans for expected changes in the source term due to changes in plant fuel performance issues.

This review represented one inspection sample.

The inspectors determined whether the licensee had developed an understanding of the plant source term, which included knowledge of input mechanisms in order to reduce the source term. The licensee's source term control strategy, which included a process for evaluating radionuclide distribution plus a shutdown and operating chemistry plan which can minimize the source term external to the core, was evaluated. Other methods used by the licensee to control the source term, including component and/or system decontamination, hotspot flushing, and the use of shielding, were also evaluated.

These reviews represented one inspection sample.

The licensee's process for the identification of specific sources was reviewed along with exposure reduction actions and the priorities the licensee had established for implementation of those actions. Results achieved against these priorities since the last refueling cycle were reviewed. For the current assessment period, the source-term reduction process was reviewed, and actions taken to reduce the overall source-term were compared to the previous year.

These reviews represented one inspection sample.

b. Findings

No findings of significance were identified.

.3 Declared Pregnant Workers

a. Inspection Scope

The inspectors reviewed the licensee's process for limiting the radiological exposure of an embryo/fetus of a declared pregnant worker including dose records in order to determine whether 10 CFR Part 20 requirements were met.

This review represented one inspection sample.

b. Findings

No findings of significance were identified.

2OS3 Radiation Monitoring Instrumentation and Protective Equipment (71121.03)

.1 Self-Contained Breathing Apparatus (SCBA) Maintenance and User Training

a. Inspection Scope

The inspectors reviewed the status, maintenance and surveillance records of selected SCBAs staged and ready for use in the plant and inspected the licensee's capability for refilling and transporting SCBA air bottles to and from the control room and operations support center during emergency conditions. The inspectors determined whether control room operators and other emergency response and RP personnel were trained and qualified in the use of SCBAs, including personal bottle change-out. This included determining whether licensee personnel were trained and qualified to refill air bottles. The inspectors also reviewed the training and qualification records for selected (more than three) individuals on each control room shift crew, and selected (more than three) individuals from each designated department that were currently assigned emergency duties including onsite search and rescue.

This review represented one inspection sample.

The inspectors reviewed the SCBA manufacturer's maintenance training certifications for licensee personnel qualified to perform SCBA maintenance on the vital components (regulator and low pressure alarm). The inspectors identified three SCBA units currently designated as "ready for service" and reviewed the maintenance records of work performed by qualified personnel on this equipment including the vital components, over the past five years. Maintenance records covering the period since the last inspection of this area were reviewed for selected SCBA units. The inspectors also determined whether the required, periodic air cylinder hydrostatic testing was current, documented and whether required Department of Transportation required air cylinder retest markings were in place for selected SCBAs. The inspectors determined whether respirator repairs were performed in accordance with the manufacturer's approved methods, and observed licensee staff inspect and refill air bottles to determine whether procedures were complied with.

This review represented one inspection sample.

b. Findings

No findings of significance were identified.

Cornerstone: Public Radiation Safety

2PS2 Radioactive Material Processing and Transportation (71122.02)

.1 Radioactive Waste System

a. Inspection Scope

The inspectors reviewed descriptions of the liquid and solid radioactive waste systems in the USAR. The 2004 effluent release report was reviewed for information on the types and amounts of radioactive waste (radwaste) generated and disposed of. The scope of the licensee's audit program for the radioactive material processing and transportation programs was reviewed to verify that it met the requirements of 10 CFR 20.1101c.

These reviews represented one inspection sample.

b. Findings

No findings of significance were identified.

.2 Radioactive Waste System Walkdowns

a. Inspection Scope

The inspectors performed walkdowns of the liquid and solid radwaste processing systems to determine if the systems agreed with the descriptions in the USAR and the Process Control Program and to assess the material condition and operability of the systems. The status of radioactive waste processing equipment that was not operational or was abandoned in place was reviewed along with the licensee's administrative and physical controls in order to determine whether the equipment would contribute to an unmonitored release path, affect operating systems, or be a source of unnecessary personnel exposure.

The inspectors reviewed changes made to the waste processing system for their impact on radwaste system operation and to determine if the changes were evaluated and documented in accordance with 10 CFR 50.59 and to assess the impact of these changes on radiation exposure to members of the public. The inspectors reviewed the current processes for transferring waste resin and sludge discharges into shipping or disposal containers to determine if appropriate waste stream mixing and/or sampling procedures were utilized. This included the methodologies for waste concentration averaging to determine if representative samples of the waste product were provided for the purposes of waste classification specified in 10 CFR 61.55 for waste disposal.

These reviews represented one inspection sample.

b. Findings

No findings of significance were identified.

.3 Waste Characterization and Classification

a. Inspection Scope

The inspectors reviewed the licensee's radio-chemical sample analysis results for each of the waste streams, including dry active waste, ion exchange resins, filters, sludge, and activation products. The inspectors also reviewed the licensee's use of scaling factors to quantify difficult-to-measure radionuclides such as pure alpha or beta emitters, and isotopes that decay by electron capture. The reviews were conducted to determine whether the licensee's program assured compliance with 10 CFR 61.55 and 10 CFR 61.56, as required by Appendix G of 10 CFR Part 20. The inspectors also reviewed the licensee's waste characterization and classification program to ensure that the waste stream composition data accounted for changing operational parameters and thus remained valid between the annual sample analysis updates.

These reviews represented one inspection sample.

b. Findings

No findings of significance were identified.

.4 Shipment Preparation

a. Inspection Scope

The inspectors reviewed the records of training provided to personnel responsible for the conduct of radioactive waste processing and radioactive shipment preparation activities including shipment packaging, surveying, labeling, marking, placarding, vehicle checks, emergency instructions, disposal manifest, shipping papers provided to the driver, and licensee verification of shipment readiness. The review was conducted to determine whether that the licensee's training program provided training consistent with NRC and Department of Transportation requirements.

This inspection sample was credited in Inspection Report 05000440/2004007.

b. Findings

No findings of significance were identified.

.5 Shipping Records

a. Inspection Scope

The inspectors reviewed five non-excepted package shipment manifests/documents completed in 2004 and 2005 to determine compliance with NRC and Department of Transportation requirements (i.e., 10 CFR Parts 20 and 71, and 49 CFR Parts 172 and 173). This included required emergency response information and the 24-hour contact telephone number.

This review represented one inspection sample.

b. Findings

No findings of significance were identified.

.6 Identification and Resolution of Problems for Radioactive Material Processing and Transportation

a. Inspection Scope

The inspectors reviewed CRs, audits, and self-assessments that covered the period from the last inspection of this area and addressed deficiencies in the radioactive waste and radioactive materials shipping program. This was done in order to determine whether the licensee had effectively implemented the corrective action program and that problems were identified, characterized, prioritized and corrected. The inspectors also verified that the licensee's self-assessment program was capable of identifying and addressing repetitive deficiencies or significant individual deficiencies that had been identified in the problem identification and resolution area.

The inspectors also reviewed corrective action reports from the radioactive material and shipping programs since the previous inspection, and interviewed staff and reviewed documents to determine if the following activities were being conducted in an effective and timely manner commensurate with their importance to safety and risk.

- Initial problem identification, characterization, and tracking;
- Disposition of operability/reportability issues;
- Evaluation of safety significance/risk and priority for resolution;
- Identification of repetitive problems;
- Identification of contributing causes;
- Identification and implementation of effective corrective actions;
- Resolution of NCVs tracked in the corrective action system; and
- Implementation/consideration of risk-significant operational experience feedback.

These reviews represented one inspection sample.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151)

Cornerstones: Occupational and Public Radiation Safety

Radiation Safety Strategic Performance Area

a. Inspection Scope

The inspectors sampled the licensee's Performance Indicator (PI) submittals for the periods listed below. The inspectors used PI definitions and guidance contained in Revision 3 of Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," to determine the accuracy of the PI data. The following PIs were reviewed:

- Occupational Exposure Control Effectiveness

The inspectors reviewed the licensee's assessment of the PI for occupational radiation safety to determine if indicator related data was adequately assessed and reported during the previous four quarters. The inspectors compared the licensee's PI data with the CR database, reviewed radiological restricted area exit electronic dosimetry transaction records, and conducted walkdowns of accessible LHRA entrances to determine the adequacy of controls in place for these areas. Data collection and analysis methods for PIs were discussed with licensee representatives to determine if there were any unaccounted for occurrences in the Occupational Radiation Safety PI as defined in Revision 3 of Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline."

This review represented one inspection sample.

- Radiological Environmental Technical Specification/Offsite Dose Calculation Manual (RETS/ODCM) Radiological Effluent Occurrences

The inspectors reviewed data associated with the RETS/ODCM PI to determine if the indicator was accurately assessed and reported. This review included the licensee's CR database for the previous four quarters to identify any potential occurrences such as unmonitored, uncontrolled or improperly calculated effluent releases that may have impacted offsite dose. The inspectors also selectively reviewed gaseous and liquid effluent release data and the results of associated offsite dose calculations and quarterly PI verification records generated over the previous four quarters. Data collection and analyses methods for PIs were discussed with licensee representatives to determine if the process was implemented consistent with industry guidance in Revision 3 of Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline."

This review represented one inspection sample.

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems (71152)

The inspectors completed two annual inspection samples of the licensee's problem identification and resolution program as described in sections 4OA2.2 and 4OA2.3.

.1 Routine Review of Identification and Resolution of Problems

a. Inspection Scope

As discussed in previous sections of this report, the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to determine whether they were being entered into the licensee's corrective action program at an appropriate threshold, that adequate attention was being given to timely corrective actions, and that adverse trends were identified and addressed.

This routine review is not considered an inspection sample.

b. Findings

No findings of significance were identified.

.2 Annual Sample Review - Emergency Service Water Pumps

a. Inspection Scope

The inspectors selected the root cause report associated with CR 05-01676, "As Found Condition of 1P45C0001A," dated March 2, 2005, for detailed review. This CR was associated with the Division 1 ESW pump non-conforming conditions that were identified when the pump was disassembled during RFO 10. The inspectors selected this root cause based on the safety significance of the ESW system and the negative performance trend associated with ESW pump maintenance activities. The root cause was reviewed to determine whether the full extent of issues were addressed and whether appropriate corrective actions were specified as required by 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action."

This was an annual sample review of the licensee's problem identification and resolution program and constituted the first of two samples for this inspection procedure.

b. Findings and Observations

Introduction: A finding of very low safety significance and a non-cited violation of TS 5.4, "Procedures," was self-revealed on March 2, 2005, during disassembly of the Division 1 ESW pump. Specifically, licensee personnel failed to provide appropriate guidance in GMI-0039, "Disassembly/Assembly of the Emergency Service Water Pumps," Revision 8,

to ensure that the lineshaft sleeve spirol pins were adequately staked during pump assembly in May 2004. Due to the improper assembly, the pump's lineshaft sleeve spirol pins were found, in March 2005, to be extruded and sheared. Fortunately, the pins and sleeves galled to the shaft and the lineshaft sleeves remained in place. As a result, no loss of safety function occurred.

Description: On March 2, 2005, during a planned inspection of the Division 1 ESW pump upper shaft coupling, the licensee found that the spirol pins on the upper three lineshaft sleeves were axially sheared and that the pins and sleeves were galled to the shaft. The licensee concluded that the spirol pins had not been adequately staked on the pump lineshaft sleeves. The licensee identified inconsistencies between the spirol pin manufacturer's installation guidance and GMI-0039, "Disassembly/Assembly of the Emergency Service Water Pumps," Revision 8, and concluded that procedure adequacy contributed to the inadequate assembly. As such, the inspectors determined that the licensee failed to implement appropriate procedures which was a performance deficiency. The failure to properly stake the pins allowed the pins to extrude and subsequently shear. The lineshaft sleeves remained in place because the pins and sleeves galled to the shaft. Additionally, the licensee reviewed the Division 1 ESW pump performance data (flow, vibration, and surveillance testing) and determined that all parameters indicated normal function from May 25, 2004, through March 2, 2005.

The inspectors reviewed the licensee's Root Cause Report, "Emergency Service Water Pump 'A' Bearing Sleeve Pins Sheared," dated May 27, 2005. The root cause report addressed several issues related to the as-found condition of the pump. Specifically, the licensee's investigation included concerns with bearing design as well as the licensee's identification that the bearing material was not as specified in vendor drawings. As such, the licensee's root cause report attributed the as-found condition to: (1) less than adequate vendor supplied parts, (2) less than adequate vendor and site assembly instructions, (3) less than adequate vendor bearing design, and (4) less than adequate procurement barriers. The licensee established numerous corrective actions to address the identified issues including procedure changes and maintenance training on spirol pin installation. The inspectors noted that these actions were completed prior to pump reassembly. Additionally, the licensee established longer term corrective actions to address programmatic concerns such as procurement barriers.

Analysis: The inspectors determined that the licensee's failure to implement appropriate procedures for safety-related pump maintenance activities was a performance deficiency warranting a significance evaluation. The finding was more than minor because the failure to implement appropriate maintenance procedures could reasonably be viewed as a precursor to a significant event as evidenced by the two previous Division 1 ESW pump failures in September 2003 (VIO 05000440/2004005-01), and May 2004 (NCV 05000440/2004011-02). The finding was associated with the cross-cutting area of Human Performance, subcategory organization, because licensee personnel failed to establish appropriate procedures for maintenance on safety-related equipment. Using IMC 0609, Appendix A, "Significance Determination of Reactor Inspection Findings for At-Power Situations," dated December 1, 2004, the inspectors reviewed the finding

against the Phase 1 Screening Worksheet affecting the Mitigating Systems Cornerstone. The inspectors determined that there was no actual loss of safety function, and therefore concluded that the finding was of very low safety significance.

Enforcement: Technical Specification 5.4 required written procedures to be implemented covering applicable procedures recommended by Regulatory Guide 1.33. Regulatory Guide 1.33, Appendix A, paragraph 9a, stated, "Maintenance that can affect the performance of safety-related equipment should be properly preplanned and performed in accordance with written procedures, documented instructions, or drawings appropriate to the circumstances." Contrary to this requirement, the licensee failed to implement procedures that were appropriate to the circumstances in that the maintenance resulted in spiro pins that were inadequately staked as evidenced by the subsequent extrusion and failure of the pins. The inspectors concluded the condition existed from May 25, 2004 (completion of pump reassembly activities) through discovery on March 2, 2005. Because of the very low safety significance and because the issue has been entered into the licensee's corrective action program (CR 05-01676), the issue is being treated as an NCV consistent with Section VI.A.1 of the NRC Enforcement Policy **(NCV 05000440/2005009-05)**.

As part of the licensee's immediate corrective actions, the ESW pump was repaired and returned to service.

.3 Annual Sample Review - Licensee Root Cause Evaluation

n. Inspection Scope

The inspectors selected the root cause report associated with CR 05-04112, "Temporary Test Gauges Left Installed After Troubleshooting of G33-F052B," dated May 6, 2005, for detailed review. Regulatory action associated with the failure to remove the gauges prior to plant restart following RFO 10 is documented in NRC Inspection Report 05000440/2005009 as NCV 05000440/2005006-06. The root cause was reviewed to determine whether the root and contributing causes were identified, the extent of condition appropriately evaluated, and whether appropriate corrective actions were specified as required by 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action."

This was an annual sample review of the licensee's problem identification and resolution program and constituted the second of two samples for this inspection procedure.

o. Findings and Observations

The licensee's evaluation identified two root causes. The first was instrumentation and control supervision's lack of ownership and questioning attitude. The second was a programmatic weakness which allowed too much flexibility in the preparation of WO addenda associated with Problem Solving Plans. Since the first root cause was essentially a performance management issue, the identified corrective actions focused on human performance training and the reinforcement of expectations. The second root cause was addressed by implementing changes to licensee business practice procedure NOBP-WM-1101, "Order Planning Process Instructions," Revision 0. The changes

intended to define a standard format for WO attachments and implement a requirement for signature steps for attachment completion.

The inspectors noted that the licensee's evaluation also identified that the uses of the Problem Solving Plan lead engineer for the coordination of work activities involving engineering, operations, and maintenance personnel, including test control was beyond the responsibilities of the position and was not consistent with management expectations.

After reviewing the licensee's root cause evaluation and attending a licensee corrective action review board meeting at which the root cause evaluation was approved, the inspectors concluded that the licensee failed to identify all contributing causes. Specifically, the inspectors noted that the condition which initiated the installation of the test gauges - problems with the testing of the G33-F052B check valve, was a high priority restart restraint late in an extended RFO. As a restart restraint, the issue was subject to the licensee's process for ensuring adequate closure of restart restraints as defined in licensee procedure NOBP-OM-4010, "Restart Readiness for Plant Outages," Revision 3. The failure of this barrier was not addressed by the licensee. Additionally, the licensee failed to identify other aspects of the restart process such as system walkdowns. The licensee entered the inspectors' concerns into their corrective action program as CR-06281, "Root Cause 05-04112 Potential Contributing Causes Not Adequately Considered," dated August 11, 2005. Because these issues were only potential contributing causes, the deficiencies were considered to be minor in nature.

40A4 Cross-Cutting Aspects of Findings

- .1 A finding described in Section 1R04.1 of this report had, as its primary cause, a problem identification and resolution deficiency in that the licensee failed to promptly correct a condition of adverse to quality. Specifically, the licensee failed to repair a degraded SLC storage tank heater flange despite numerous opportunities to do so during RFOs.
- .2 A finding described in Section 1R14.2 of this report had, as its primary cause, a problem identification and resolution deficiency in that the licensee failed to promptly correct a condition adverse to quality. Specifically, the licensee failed to take adequate compensatory or remedial action after identifying a leak detection thermocouple was not providing an indication representative of actual room temperature due to its location. As a result of the failure to take prompt action, an automatic isolation of the RWCU system occurred. Additionally, system transients resulted in a non-regenerative heat exchanger vessel flange leak.
- .3 A finding described in Section 1R22 of this report had, as its primary cause, a problem identification and resolution deficiency in that the licensee failed to identify a condition adverse to quality. This resulted in nine hours of unplanned unavailability of the RHR 'B' low pressure core injection and containment spray modes of operation.

- .4 A finding described in Section 2OS1.2.1 of this report had, as its primary cause, a human performance deficiency in that the licensee failed to follow procedures for access control to radiologically significant areas. Specifically, a supervisor entered the turbine building condenser bay without ensuring that he was on the appropriate RWP and failed to receive the required RP briefing for entry into an HRA/contaminated area.
- .5 A finding described in Section 2OS1.2.2 of this report had, as its primary cause, a human performance deficiency in that the licensee failed to follow procedures for access control to radiologically significant areas. Specifically, licensee personnel entered a LHRA without the required RP briefing.
- .6 A finding described in Section 4OA2.2 of this report had, as its primary cause, a human performance deficiency in that the licensee failed to implement appropriate procedures for maintenance on safety-related equipment. Specifically, the licensee failed to implement procedures that were appropriate to the circumstances in that the maintenance on the Division 1 ESW pump resulted in spirol pins that were inadequately staked as evidenced by the subsequent extrusion and failure of the pins.

4OA5 Other Activities

.1 Temporary Instruction 2515/161 - Transportation of Reactor Control Rod Drives in Type A Packages

a. Inspection Scope

The inspectors conducted interviews and record reviews to determine whether: (1) the licensee had undergone refueling activities since calendar year 2002; and (2) did not ship irradiated control rod drive mechanisms in Department of Transportation Specification 7A, Type A packages during the time frame 2002 to the present.

b. Findings

No findings of significance were identified.

.2 Problem Identification and Resolution Inspection - IP 71152

Inspection Procedure (IP) 71152, "Identification and Resolution of Problems," is "Complete by Reference," to IP 95003, performed between January and May 2005 and documented in Inspection Report 05000440/2005003.

.3 Notice of Violation and Civil Penalty Issued to FENOC

On February 24, 2005, the NRC issued a Notice of Violation (NOV) and proposed a Civil Penalty of \$55,000 to FirstEnergy Nuclear Operating Company (FENOC) associated with a violation of 10 CFR 50.7, "Employee Protection," by its contractor Williams Power Corporation (EA-01-083). The violation occurred when the Williams Power Corporation Site Superintendent discriminated against painters employed by Williams Power for having engaged in protected activities. The licensee has implemented corrective actions

and the NRC will evaluate the effectiveness of those corrective actions during future inspections. (VIO 50-440/2005009-08)

4OA6 Meetings

.1 Exit Meeting

On October 4, 2005, the resident inspectors presented the inspection results to Mr. R. Anderson, Site Vice President, and other members of his staff, who acknowledged the findings.

The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

.2 Interim Exit Meetings

Interim exit meetings were conducted for:

- The access control to radiologically significant areas program, the ALARA planning and controls program, and the radioactive material processing and transportation program with Mr. F. von Ahn on July 22, 2005; and
- The radiation monitoring instrumentation and protective equipment program with Mr. F. von Ahn on September 16, 2005.

4OA7 Licensee-Identified Violations

The following violations of very low safety significance (Green) were identified by the licensee and are violations of NRC requirements which meet the criteria of Section VI of the NRC Enforcement Policy, NUREG-1600, for being dispositioned as NCVs.

Cornerstone: Initiating Events

- As required by 10 CFR 50.65 (a)(4), before performing maintenance activities the licensee shall assess and manage the increase in risk that may result from the proposed maintenance activities. Contrary to this requirement, on August 25, 2005, the licensee performed maintenance on two switchyard breakers that were scheduled for the following week and thus had not been analyzed for risk for the week in which the work was performed. Additionally, the maintenance was scheduled such that only one breaker would have been affected at a time. Contrary to this, work was performed on both breakers concurrently. The impact to switchyard configuration and risk associated with concurrent maintenance had not been analyzed. This issue was entered in the licensee's corrective action program as CR 05-06314. The inspectors determined that the finding was more than minor because the finding was associated with risk assessment and the licensee failed to consider maintenance activities in the switchyard that could increase the likelihood of initiating events. The inspectors reviewed the finding in accordance with IMC 0609, Appendix K, dated May 19, 2005. Inspectors determined that the finding was of very low safety

significance because the incremental core damage probability associated with the actual maintenance risk delta was less than 1E-6.

Cornerstone: Mitigating Systems

- Technical Specification 5.4, "Procedures," required the implementation of the applicable procedures recommended in Regulatory Guide 1.33, Revision 2, Appendix A. Regulatory Guide 1.33, Appendix A, Part 8, recommended procedures for each surveillance test, inspection, or calibration listed in TS. Contrary to this requirement, on September 15, 2005, the licensee failed to perform the TS Surveillance 3.3.3.2, "Remote Shutdown," procedure SVI-C61-T1202, in that step 5.2.1.2 was not performed as written. Specifically, step 5.2.1.2 required RHR 'B' to be verified in secured status. Although a reactor operator had signed for completion of verifying RHR 'B' in secured status, the system was not in secured status. Subsequent procedure steps were performed. When a field operator contacted the control room prior to performing step 5.2.3.1, which would have shut the RHR 'B' suppression pool suction valve while the RHR 'B' pump was in standby, a control room operator identified the error. The licensee entered the issue into their corrective action program as CR 05-06643. The inspectors determined that the finding was more than minor because it could be reasonably viewed as a precursor to a more significant event in that, if the licensee had not recognized the error prior to shutting the suction valve as directed by procedure, it would have left the RHR pump in standby with an isolated suction thereby increasing the likelihood for system damage. The inspectors determined that the finding was of very low safety significance because it did not represent an actual loss of system safety function in that RHR 'B' had been declared inoperable at the start of the surveillance test and there was no actual equipment consequence.

Cornerstone: Occupational Radiation Safety

- C 10 CFR 20.1703 requires, in part, that individuals who are authorized by a licensee to use respiratory protective equipment be determined by a physician to be medically qualified for such use. Contrary to this requirement, the licensee determined that on March 2, 2005, two individuals were issued respiratory equipment without the required medical qualification. This issue was entered in the licensee's corrective action program as CR 05-01932. The issue was determined to be of very low safety significance as the individuals were not in an immediate danger to life and health atmosphere and could remove the respirators if they were experiencing any difficulty.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

R. Anderson, Vice President-Nuclear
F. von Ahn, General Manager, Nuclear Power Plant Department
E. Gordon, Radiation Protection Supervisor
J. Lausberg, Manager, Regulatory Compliance
T. Lentz, Director, Performance Improvement Initiative
R. Lieb, Radiation Protection Supervisor
J. Messina, Manager, Operations
K. Russell, Regulatory Affairs
S. Thomas, Radiation Protection Manager
M. Wayland, Maintenance Manager

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

NCV 05000440/2005009-01	NCV	Failure to Correct Boron Leakage from the Standby Liquid Control Storage Tank Heater Flange (Section 1R04.1)
NCV 05000440/2005009-02	NCV	Failure to Evaluate Interference With the Design Rattle Space Between Safety Class Buildings (Section 1R05)
NCV 05000440/2005009-03	NCV	Automatic ESF Actuation Due to Untimely Corrective Actions and Ineffective Interim Actions (Section 1R14.2)
NCV 05000440/2005009-04	NCV	Failure to Implement Procedures to Ensure Satisfactory Maintenance on the RHR Containment Spray Isolation Valve (Section 1R22)
NCV 05000440/2005009-05	NCV	Contractors in High Radiation Area Without Required Permit (Section 2OS1.2.1)
NCV 05000440/2005009-06	NCV	Entry Into a Locked High Radiation Area Without Required Radiation Protection Briefing (Section 2OS1.2.2)
NCV 05000440/2005009-07	NCV	Failure to Implement Procedures to Ensure Proper Reassembly of Division 1 ESW Pump (Section 71152)

Discussed

VIO 05000440/2005009-08	VIO	Notice of Violation and Civil Penalty issued to FENOC
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LIST OF DOCUMENTS REVIEWED

The following is a list of documents reviewed during the inspection. Inclusion on this list does not imply that the NRC inspectors reviewed the documents in their entirety but rather that selected sections or portions of the documents were evaluated as part of the overall inspection effort. Inclusion of a document on this list does not imply NRC acceptance of the document or any part of it, unless this is stated in the body of the inspection report.

1R01 Adverse Weather Protection

PTI-GEN-P0023; Mussel Monitoring; Revision 3
PTI-GEN-P0024; Mussel Treatment; Revision 7
CR 02-03809; Zebra Mussel Treatment Post Job Critique; dated September 25, 2002
CR 04-04039; Zebra Mussels and Tubercles Were Found in 'B' Turbine Lube Oil Cooler; dated August 3, 2004
CR 04-04467; Zebra Mussel PTI - HX Monitoring; dated August 30, 2004
CR 04-04511; Zebra Mussel PTI Extended; dated August 31, 2004

1R04 Equipment Alignment

VLI-C41; Standby Liquid Control System; Revision 7
SOI-C41; Standby Liquid Control System; Revision 1
PIF 97-0765; Untitled; dated May 6, 1997
PAP-1608; Corrective Action Program; Revision 3
NOP-LP-2001; Condition Report Process; Revision 11
CR 02-00229; NRC Notice #2002-05, FME in SLC Tanks; dated January 23, 2002
CR 02-02015; Boron Residue on 1C41A0001; dated June 24, 2002
CR 02-02586; Boron Leak Found on SLC Tank in Containment; dated August 4, 2002
CR 03-02615; Boron Residue in Containment; dated April 29, 2003
CR 03-02689; Boric Solution Leak in Containment; dated April 30, 2003
CR 03-04281; C41 Tank Heater Leak; dated July 17, 2003
CR 04-06599; Low Temperature Alarm on SLC Heat Trace; dated December 14, 2004
CR 05-00066; 1C41D011B Has Boric Acid Residue; dated January 4, 2005
CR 05-01128; Dried Boron Solution Found During ISI on SLC A Loop; dated February 11, 2005
CR 05-05938; Untimely Resolution of a Condition Adverse to Quality Issue; dated August 9, 2005
VLI-E51; Reactor Core Isolation Cooling System; Revision 7
CR 05-03076; Evaluate Valve Thrust Value for RCIC Steam Supply Isolation Valve; dated April 5, 2005
CR 05-03780; 1E51F0066 Failed Its PMT and Surveillance; dated April 26, 2005
VLI-P42; Emergency Closed Cooling System; Revision 11
Drawing D 302-0621-00000; Emergency Closed Cooling System; Revision PP
VLI-R44; Division 1 and Division 2 Diesel Generator Starting Air System (Unit 1); Revision 4
VLI-R45; Division 1 and Division 2 Diesel Generator Fuel Oil System (Unit 1); Revision 4
VLI-P45; Emergency Service Water System; Revision 7

Drawing D-302-791; Emergency Service Water System; Revision RR
Drawing D-302-792; Emergency Service Water System; Revision KK

1R05 Fire Protection

FPI-0CC Fire Zone 0CC-2A; 599' Elevation East; Revision 5
FPI-0CC Fire Zone 0CC-2B; 599' Elevation Northwest; Revision 5
FPI-0CC Fire Zone 0CC-2C; 599' Elevation Southwest; Revision 5
FPI-0IB Fire Zone 0IB-1; Intermediate Building 574' Elev. and Pipe Chase 585' Elev.;
Revision 4
FPI-1AB Fire Zone 1AB-1; Unit 1 599' Elevation; Revision 2
FPI-1AB Fire Zone 1AB-1G; Unit 1-Corridor 574' 10" Elevation; Revision 2
FPI-1AB Fire Zone 1AB-3A; Unit 1 620'-6" Elevation East; Revision 2
FPI-1AB Fire Zone 1AB-3B; Unit 1 620'-6" Elevation West; Revision 2
FPI-0FH; Fuel Handling Building; Revision 3
CR 05-06133; NRC Identified Concerns; dated August 18, 2005
CR 05-05548; NRC Observation of Cage on IB574; dated July 22, 2005
CR 05-05898; NRC Observation of Storage Cage in the Intermediate Building,
574' Elevation; dated July 22, 2005
FPI-XFMR; Transformer Yard Areas; Revision 1
FPI-TPB; Turbine Power Building; Revision 2
FPI-TPB Turbine Power Building; Revision 2
CR 04-05119; RFA to Store Chemicals in MS1 Electrical Shop; dated October 1, 2004

1R06 Flood Protection

CR 05-04296; NRC Information Notice 2005-11; dated May 16, 2005
CR 05-00293; OE 19025 - Reactor Water Clean-Up Backwash Tank Overflowed -
Re-Issue; dated January 13, 2005
CR 04-03502; DB-1-A Inverter Trip; dated July 7, 2004
CR 04-06761; Numerous Leaks from Various Plant Roofs; dated December 23, 2004
CR 05-00835; Building Roofing Material Condition - Collective Review; dated
February 2, 2005
CR 05-05415; Roof Leaks Continue to Pose a Threat to Vital Plant Equipment; dated
July 16, 2005
CR 05-05937; Corrective Action Plan for Building Roof Leaks is Incomplete; dated
August 9, 2005
Non-Safety and Safety-Related Structures (a)(1) Action Plan; dated February 2, 2005

1R12 Maintenance Effectiveness

Control Room Logs; dated July 2004 through June 2005
Plant Health Report; 2004-4; fourth quarter 2004
PAP-1910; Fire Protection Program; Revision 10
CR 03-06543; Maintenance Rule Unavailability Review Based on Approaching 80% of
the Limit; dated December 8, 2003
CR 04-01184; Diesel Fire Pump Fuel Leak Puddling on Foundation; dated
March 8, 2004

CR 04-01555; Loss of Diesel Driven Fire Pump Keepwarm Heaters; dated March 27, 2004
CR 04-04787; Acceptability of the Portable Diesel Fire Pump as a Backup Fire Pump; dated September 14, 2004
CR 04-04818; Temporary Portable Fire Pump Installation Timeliness & Associated CR Categorization; dated September 18, 2004
CR 04-05061; Temporary Portable Diesel Fire Pump Installed Without Bounding Limitations; dated September 28, 2004
CR 04-05427; Auto Start of the Motor Driven Fire Pump; dated October 15, 2004
CR 05-00101; Decrease in Specific Gravity Levels for Diesel Driven Fire Pump Batteries; dated January 6, 2005
CR 05-02782; Diesel Fire Pump Battery Has Minor Seepage From Top Cover; dated March 28, 2005
CR 05-05161; Unplanned Fire Impairment for the Diesel Fire Pump (P54-C0001); dated June 24, 2005
CR 05-06427; Failure of the Motor-Driven Fire Pump Pressure Regulating Valve; dated September 3, 2005
CR 05-05410; Unit 1 Service Air Compressor Trip And Auxiliary Oil Pump Failure; dated July 16, 2005
CR 05-05409; Unexpected Alarms While Stopping Unit 2 Service Air Compressor; dated July 16, 2005
CR 05-05412; Unit 2 Air Compressor Suction Filter Damaged; dated July 16, 2005
CR 04-03917; Unit One Service Air Compressor Switches Loose; dated July 27, 2004
CR 04-00051; Starting An Air Compressor With No Instrument Air; dated January 5, 2005
CR 03-05906; Trip Of Unit 1 Service Air Compressor During Startup From High Oil Temperature; dated October 27, 2003
CR 03-04233; Trip Of Unit 2 Service Air Compressor During Startup From High Oil Temperature; dated July 11, 2003
CR 03-00029; 1/16" Pin Hole Leak Found On Unit 1 Service Air Compressor Tubing; dated January 5, 2003
CR 04-05609; 2P52C0001 Trip Causes Entry Into ONI-P52; dated October 26, 2005
CR 05-06063; Preventive Maintenance Deferral Form For PM Past Overdue Date; dated August 15, 2005
CR 04-02144; Request For A Design Change To The Service And Instrument Air Compressors; dated April 27, 2005
CR 05-05522; Latent Issue - Equipment Reliability Instrument And Service Air Compressors; dated July 22, 2005
CR 05-05539; Unsatisfactory Material Condition Of The Units Air Compressors (P51/P52); dated July 22, 2005
Maintenance Rule Monitor Report; Instrument Air; dated August 16, 2005
CR 05-02843; Pitting/Erosion Observed Downstream of Orifice 1E22-D001; dated March 30, 2005
CR 05-00632; Fuse Improperly Seated; dated January 25, 2005
CR 04-06697; HPCS Waterleg Pump Discharge Pressure Trending Downward; dated December 20, 2004
1E22C0002A HPCS Pump (a)(1) Action Plan; dated October 2, 2003

1E22C0002A HPCS Pump Maintenance Rule (a)(2) Disposition Form; dated October 15, 2004
PEI-SPI 4.2; RHR Loop B Flood Alternate Injection; Revision 1
PEI-SPI 4.6; Fast Fire Water Alternate Injection; Revision 1

1R13 Maintenance Risk Assessments and Emergent Work Control

On-Line Probabilistic Safety Assessment; Week 12, Period 1; Revision 0
PAP-1924; Risk-Informed Safety Assessment and Risk Management; Revision 4
CR 05-05611; Inadequate Communication Of Conversion Economics Grid Classification; dated July 7, 2005
Probabilistic Safety Assessment; Week 2, Period 2; Revision 1
CR 05-05940; NRC Reported to Control Room of Valve 1E51R0004-F Found Out of Position; dated August 9, 2005
CR 05-05941; NRC Concern on Valve Mounted Upside Down (Backwards); dated August 9, 2005
CR 05-05965; NRC Identified Items During Walkdown; dated August 10, 2005
Probabilistic Safety Assessment; Week 7, Period 2; Revision 1
PNPP Form No. 10241; Division 2 Outage (Yellow) Protected Equipment Posting Checklist; dated September 13, 2004

1R14 Operator Performance During Non-routine Evolutions and Events

CR 05-05135; Main Lube Oil Cooler B Operating at Reduced Efficiency; dated July 1, 2005
SOI-N34; Main Lube Oil System; Revision 10
Control Room Logs; July 2, 2005, through August 12, 2005
Problem Solving Plan; Temperature Instrumentation for 1E31-N043B is Indicating a Higher Temperature Than Expected for the Reactor Water Cleanup Valve Nest Room; Revision 1
CR 05-05156; RWCU System Valve Nest Room Has Elevated Temperatures; dated July 2, 2005
CR 05-06011; RWCU System Isolation on Valve Nest Room Temperature High; dated August 12, 2005
CR 05-06016; Organizational Ineffectiveness Results in RWCU Isolation; dated August 13, 2005

1R15 Operability Evaluations

PAP-1910; Fire Protection Program; Revision 10
CR 05-05161; Unplanned Fire Impairment for the Diesel Fire Pump (P54-C0001); dated June 24, 2005
Control Room Logs; dated June 24, 2005, through July 5, 2005
CR 05-05362; Diesel Bldg Missile Shield Structure Concrete Repairs Were Not Performed; dated July 14, 2005
Control Room Logs; dated July 21, 2005, and July 22, 2005
Calculation 10:13.001; Revision 1
CR 05-01092; RHR Heat Exchanger Inlet Safety Valves; dated February 17, 2005

CR 05-06564; MOV 1E12F0027A Valve Weaklink; dated September 13, 2005
CR 05-06591; NRC ID Questions if 1E12F0028B was Greased Properly; dated
September 13, 2005
CR 05-06699; 1P45F0068B Failed to Stroke Full Closed

1R16 Operator Workarounds

M&C.-14; Work Around Policy; dated February 15, 2000
WO 200157417; Division 2 DG Jacket Water Heater Not Controlling Temperature
Properly; dated June 30, 2005
Control Room Logs; May 1, 2005, through June 30, 2005
CR 05-05050; Division 2 D/G Jacket Water Temperature Switch Still Not Working; dated
June 28, 2005
SOI-P54(WTR); Fire Protection System - Water; Revision 6
CR 04-05427; Auto Start of the Motor Driven Fire Pump; dated October 15, 2004
Operations Night Order; dated July 1, 2005
Work Around/Control Room Deficiency Identification Sheet; 1G33F0557A Has a Packing
Leak; dated August 19, 2005
Work Around/Control Room Deficiency Identification Sheet; Control Rod Drive Mech
Temperatures are Cycling Greater Than 250 °F
ARI-H13-P601-0022; Control Rod Drive; Revision 6
Operation Work Around Log; dated August 29, 2005

1R19 Post-Maintenance Testing

PTI-P54-P0036; Diesel Fire Pump Flow Data and Control Panel Testing; Revision 8
WO 200115815; Diesel Fire Pump Start Switch Replacement; dated July 12, 2005
SVI-E51-T2001; RCIC Pump and Valve Operability Test; Revision 23
SVI-T23-T1016; Containment Airlock Interlock Verification; Revision 6
CR 05-06126; Lower Airlock Interlock Mechanism Failed PMT; dated August 18, 2005
WO 200035234; Test Check RHR B Pump Breaker EH1208; dated September 14, 2005
WO 200133575; Division 2 EDG Fuel Hose Replacement; dated September 12, 2005
WO 200075252; PY-1P42 Emergency Closed Cooling; dated September 12, 2005
PMI-0050; Preventive Maintenance Lubricating Guidelines; Revision 3
PMI-0004; General Maintenance Checks; Revision 2
SVI-C-61-T1202; Remote Shutdown Control Test - Division 2 RHR, ECC, and ESW;
Revision 4
CR 05-06665; Div 2 D/G Head Cover Gasket Bolt Found Loose by NRC; dated
September 15, 2005

1R22 Surveillance Testing

Control Room Logs; dated July 25, 2005, and July 26, 2005
CR 05-05024; Containment Isolation Valve 1E12F0028B Failed SVI; dated
June 25, 2005
CR 05-06532; NRC ID Concerns with Investigation of CR 05-5024 [sic]; dated
September 9, 2005

WO 200156540; Isolation to Containment Spray B Loop, 1E12F0028B Failed Stroke Time for SVI; dated June 29, 2005
CR 05-01957; Valve 1E12F0028B Unacceptable Stroke Times; dated March 8, 2005
WO 200063744; Isolation to Containment Spray B Loop, CC-ECP 03-0245A Replace Actuator Motor; dated April 23, 2005
WO 200061255; Static MOV/CNTMT Spray B First Shutoff; dated April 7, 2005
WO 200113237; Standby Liquid Control A Pump and Valve Operability Test; dated August 8, 2005
SVI-C41-T2001-A; Standby Liquid Control A Pump and Valve Operability Test; Revision 9
CR 05-02927; NRC ID: Pipe to Standby Liquid Control Pump "B" Oil Sightglass is Bent; dated March 30, 2005
CR 05-05751; NRC Walkdown Items C41-Standby Liquid Control; dated July 29, 2005
CR 05-05919; NRC Identified Communication Radio Failure Potentially Affecting SVI-C41-T2001A; dated August 9, 2005
CR 05-05961; NRC Walkdown Items C41-Standby Liquid Control; dated August 8, 2005
CR 05-02863; Document the Condition of the ESW Piping Coating; dated March 30, 2005
CR 04-01381; ESW Sluice Gate (1P45D0004A/B) Calculation P45-063, R/1 Deficiency; dated March 18, 2004
CR 04-02179; RFA: Clarification of NRC Statement Within LAR 114 SER; Required Actions; dated April 28, 2004
SVI-P45-T2001; ESW Pump A And Valve Operability Test; Revision 14
WO 200032924; ESW Pump A And Valve Operability Test; dated August 9, 2005
WO 200113485; MSL High Flow Channel A Functional For 1E31-N687A And 1E31-N689A; dated August 1, 2005
CR 05-05766; Master Trip Unit Setpoint Drift and Stability; dated August 2, 2005
SVI-C61-T1202; Remote Shutdown Control Test - Division 2 RHR, ECC, and ESW; Revision 4

1R23 Temporary Plant Modifications

PAP-1121; Conduct of Infrequently Performed Tests or Evolutions; Revision 3
WO 200166750; Reactor Water Cleanup Non-Regenerative Heat Exchanger Clamp Installation; dated August 31, 2005
CR 05-06400; Engineering Review Alternate Sealant on 1G33B0002A Heat Exchanger Flange Clamp; dated September 1, 2005
CR 05-06417; Engineering Review of Additives for Sealant on 1G33B0002A HX Flange Clamp; dated September 2, 2005
CR 05-06429; Allow Stainless Steel Crush Tubing and Modify Injection Ports on HX Clamp; dated September 4, 2005
CR 05-06258; RFA-Two Piece Leak Sealant Clamp Will Not Fit Due to Obstructions; dated August 23, 2005
CR 05-06456; RWCU HX Room Temperature Swing; dated September 7, 2005

1EP6 Drill Evaluation

Controller's Book; Perry Power Plant 2005 ERO Team "B" Drill; dated July 19, 2005

2OS2 As Low As Is Reasonably Achievable (ALARA) Planning And Controls

Spent Fuel Pool Inventory Log; dated July 21, 2005
Source Term Reduction Charter, 2005-2009; Version 1
RFO 10 Water Purification Plan; Revision 0
ALARA Post Job Evaluation 05-013; SRV/MSIV Activities; dated May 5, 2005
ALARA Post Job Evaluation 05-021; Operations Activities; dated May 6, 2005
ALARA Post Job Evaluation 05-024; Refueling Activities; dated May 5, 2005
ALARA Post Job Evaluation 05-013; MOV Activities; dated May 5, 2005
ALARA Post Job Evaluation 05-011; Undervessel Activities; dated May 5, 2005
HPI-C0008; In Line Review of Work Orders; Revision 4
HPI-C0005; RWP Preparation and ALARA Reviews; Revision 15
PAP-0114; Radiation Protection Program; Revision 9
HPI-F0006; Radionuclide Source Term Distribution; Revision 2
PAP-0123; Control of Locked High Radiation Areas; Revision 8
CR 05-00222; Individual in a Posted HRA on Incorrect RWP; dated January 10, 2005
CR 05-01959; Two Radworkers Entered HRA on a Low Risk RWP; dated March 8, 2005
CR 05-02921; Inadvertent Entry Into LHRA; dated March 31, 2005
CR 05-01728; Contract Worker Entered Posted LHRA; dated March 3, 2005
CR 05-01932; Two Individuals Issued Respiratory Protection Equipment Without Medical Qualification; dated March 2, 2005
FENOC Radiation Worker Training; Revision 1
FENOC Plant Access Training; Revision 2

2OS3 Radiation Monitoring Instrumentation and Protective Equipment

PY-C-04-01; NQA Audit, Respiratory Protection; dated April 30, 2004
HPI-G0007; Maintenance of Respiratory Protection Equipment and Operation of the Respirator Cleaning/Issue Facilities; Revision 11
HPI-G0011; Operation of Supplied Air Respirators and Breathing Air Manifold Systems; Revision 4
PAP-0510; Respiratory Protection; Revision 8
SCBA Unit Monthly Inspection Records, HP Units
SCBA Regulator Equipment Histories
Complete SCBA Tests
Respiratory Protection Equipment History
MSA Certification; dated May 18, 2005
GEN-1011-001-01; Lesson Plans for SCBA; dated October 21, 1991
CR 04-01382; Respiratory Protection Program Does Not Specify Administrator; dated March 18, 2004
CR 04-05773; PAP-510 "Respiratory Protection" Contains Outdated References; dated November 3, 2004
CR 04-06099; Respirator Fit Test Failure; dated November 16, 2004

CR 05-01354; Increased Radiation Exposure Due to Use of Respirators in Reactor Cavity; dated February 23, 2005
CR 05-02484; Failed Respirator Fit Tests Entered Into HIS-20 as Passing; dated March 20, 2005
CR 05-03486; Gauge Guards Missing from SCBA Bottles; dated April 17, 2005
CR05-03490; Incorrect Valve Installed on SCBA Bottle; dated April 17, 2005
PY-C-0501; NQA Field Observation: Respiratory Protection; dated April 1, 2005
NQA Assessment; Review of Respiratory Protection Program; dated March 25, 2004
SCBA Unit Inspection Records; dated November 29, 2004
HIS-20 Qualification and Fit Report; dated September 12, 2005
PYBP-RPS-0021; SCBA Regulator Desk Guide; Revision 0

2PS2 Radioactive Material Processing and Transportation

PY-C-04-02; NQA Audit, Radwaste; dated August 20, 2004
PY-C-04-01; NQA Audit, Radwaste; dated April 30, 2004
688RPS2004; RP Self-Assessment; dated July 22, 2004
RWI-G51; Solid Radwaste Solidification System; Revision 7
NOP-OP-2002; Shipment of Radioactive Materials/Waste; Revision 4
PCP; Process Control Program; Revision 10
Part 61 Analysis/Scaling Factors; dated March 16, 2005
WGM Radman Certification; dated July 3, 2003
RW9101-004-00; Radwaste Shipping/Handling Training
RW9101-005-00; Radwaste Shipping/Handling Training
CR05-00974; Rad Shipment Opened Without RP Tech Present; dated February 9, 2005
CR04-06728; Rad Shipment Allowed Onsite Without RP Authorization; dated December 21, 2004
CR04-01961; Barrels With Rad Material Stored in CC Elevator Landing Area For 18 Months; dated April 15, 2004
CR04-01801; Improvement Opportunities for HIC Processing Procedure; dated April 7, 2004
CR05-01642; MS Relief Valve Broke Loose During Shipment; dated February 28, 2005
Shipping Package 04-1008; LSA II Shipment; dated August 12, 2004
Shipping Package 05-1011; LSA II Shipment; dated April 29, 2005
Shipping Package 05-1014; LSA II Shipment; dated June 14, 2005
Shipping Package 05-1000; LSA II Shipment; dated February 9, 2005
Shipping Package 04-1015; Type B Shipment; dated November 17, 2004
PAP-0525; Solid Radwaste Administration; Revision 4

40A2 Identification and Resolution of Problems

System Description; Emergency Service Water (ESW) System; Revision 9
Root Cause Report; Emergency Service Water Pump 'A' Bearing Sleeve Pins Sheared; dated May 27, 2005
CR 05-01676; As Found Condition of 1P45C0001A; dated March 3, 2005
GMI-0039; Dissassembly/Reassembly of the Division I and II Emergency Service Water Pumps; Revision 18
GMI-0039; Dissassembly of the Emergency Service Water Pumps; Revision 8

CR 05-06281; Root Cause 05-04112 Potential Contributing Factors not Adequately Considered; dated August 11, 2005
Root Cause Report; Gauges Left Installed on 1E31N077B and 1E12F0059B; dated July 21, 2005

4OA7 Licensee-Identified Violations

CR 05-06314; Perry Control Room Staff Authorized Unschedule [sic] Work In Transmission Yard; dated August 25, 2005
CR 05-06313; Lack Communication Of Extended [sic] PY Transmission Yard Work; dated August 29, 2005
CR 05-06311; Unscheduled Transmission Yard Work Performed Without Notification To PSA/WWM; dated August 29, 2005
CR 05-06643; Missed Surveillance Step; dated September 15, 2005

LIST OF ACRONYMS USED

ALARA	As Low As Is Reasonably Achievable
CFR	<u>Code of Federal Regulations</u>
CR	condition report
CS	containment spray
ECC	emergency core cooling
ECCS	emergency core cooling system
EDG	emergency diesel generator
ESW	emergency service water
FENOC	FirstEnergy Nuclear Operating Company
GMI	general maintenance instruction
HRA	High Radiation Area
IMC	Inspection Manual Chapter
LHRA	locked high radiation area
LPCI	low pressure core injection
NCV	non-cited violation
NRC	Nuclear Regulatory Commission
PAP	Perry Administrative Procedure
PI	Performance Indicator
PMT	post-maintenance testing
RCIC	reactor core isolation cooling
RETS/ODCM	Radiological Environmental Technical Specifications/Offsite Dose Calculation Manual
RFO	refueling outage
RHR	residual heat removal
RP	Radiation Protection
RPT	Radiation Protection Technician
RWCU	reactor water cleanup
RWP	Radiation Work Permit
SCBA	Self-Contained Breathing apparatus
SLC	standby liquid control
SSC	structures, systems, and components
SVI	surveillance instruction
TS	Technical Specification
USAR	Updated Safety Analysis Report
VLI	valve lineup instruction
WO	work order