

January 30, 2004

EA-04-020

Mr. William R. Kanda
Vice President - Nuclear, Perry
FirstEnergy Nuclear Operating Company
P. O. Box 97, A210
10 Center Road
Perry, OH 44081

SUBJECT: PERRY NUCLEAR POWER PLANT
NRC INTEGRATED INSPECTION REPORT 05000440/2003010
PRELIMINARY WHITE FINDING

Dear Mr. Kanda:

On December 31, 2003, 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 January 8, 2004, 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.

This report discusses a finding that appears to have a low to moderate safety significance. As described in Section 4OA2.2 of this report, this finding relates to the air binding of the common waterleg pump for your residual heat removal 'A' and low pressure core spray pumps following the August 14, 2003, loss of offsite power event. This finding was assessed using the NRC Phase 3 Significance Determination Process and was preliminarily determined to be White, i.e., a finding with some increased importance to safety, which may require additional NRC inspection. This finding was also determined to be an apparent violation of NRC requirements involving the failure to develop adequate procedures for venting the residual heat removal 'A' and low pressure core spray systems. Specifically, the high point vent valve on the discharge of the waterleg pump for these systems was not included in the procedures for periodic venting of either system. As a result, gas accumulated in the discharge piping and rendered both systems inoperable.

The apparent violation is also being considered for escalated enforcement action in accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions" (Enforcement Policy), NUREG-1600. The current Enforcement Policy is included on the NRC's website at <http://www.nrc.gov>.

We believe that sufficient information was considered to make a preliminary significance determination. However, before we make a final decision on this matter, we are providing you an opportunity to present to the NRC your perspectives on the facts and assumptions used by the NRC to arrive at the finding and its significance at a Regulatory Conference or by a written submittal. If you choose to request a Regulatory Conference, it should be held within 30 days of the receipt of this letter and we encourage you to submit supporting documentation at least 1 week prior to the conference in an effort to make the conference more efficient and effective. If a Regulatory Conference is held, it will be open for public observation. If you decide to submit only a written response, such submittal should be sent to the NRC within 30 days of the receipt of this letter.

Please contact Mark A. Ring at 630-829-9703 within 10 business days of your receipt of this letter to notify the NRC of your intentions. If we have not heard from you within 10 days, we will continue with our significance determination and enforcement decision and you will be advised by separate correspondence of the results of our deliberations on this matter.

Since the NRC has not made a final determination in this matter, no Notice of Violation is being issued for this inspection finding at this time. In addition, please be advised that the number and characterization of apparent violations described in the enclosed inspection report may change as a result of further NRC review.

During the inspection period, the inspectors also identified two findings of very low safety significance (Green). The findings were determined to involve violations of NRC requirements. 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 these non-cited violations, 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, 801 Warrenville Road, Lisle, IL 60532-4351; 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.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

/ RA /

Steven A. Reynolds, Acting Director
Division of Reactor Projects

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

Enclosure: Inspection Report 05000440/2003010
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: 05000440/2003010

Licensee: FirstEnergy Nuclear Operating Company (FENOC)

Facility: Perry Nuclear Power Plant, Unit 1

Location: P.O. Box 97 A210
Perry, OH 44081

Dates: October 1 through December 31, 2003

Inspectors: R. Powell, Senior Resident Inspector
J. Ellegood, Resident Inspector
J. House, Senior Radiation Specialist
M. Bielby, Senior Operations Engineer

Approved by: Mark A. Ring, Chief
Branch 1
Division of Reactor Projects

Enclosure

SUMMARY OF FINDINGS

IR 05000440/2003010; 10/01-12/31/03; Perry Nuclear Power Plant; Maintenance Risk Assessments and Emergent Work Control; Surveillance Testing; Identification and Resolution of Problems.

This report covers a 3-month period of baseline resident and regional inspections. The inspections were conducted by resident inspectors and regional health physics and senior operations inspectors. The inspections identified one preliminary White finding which involved an Apparent Violation (AV) and two Green findings, which involved non-cited violations (NCVs). The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). Findings for which the SDP does not apply may be "Green" or be assigned a severity level after NRC management review. The NRC'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: Mitigating Systems

- To Be Determined. An apparent self-revealed violation of Technical Specification 5.4 occurred when the waterleg pump for low pressure core spray (LPCS) and residual heat removal (RHR) 'A' became air bound following a loss of offsite power. Subsequent investigation revealed that the procedures for venting these systems did not include the high point vent valve on the discharge of the pump, thus allowing gas to accumulate in a vertical section of system piping. When the waterleg pump lost power on August 14, 2003, the accumulated gas expanded and caused voiding of the pump. As a result, both LPCS and RHR 'A' were rendered inoperable.

The NRC assessed this finding through Phase 3 of the Significance Determination Process and made a preliminary determination that it is an issue with low to moderate safety significance. (Section 40A2)

- Green. The inspectors identified a Non-Cited Violation (NCV) of 10 CFR 50.65(a)(4) for the licensee's failure to manage risk during a Division 1 outage on November 3, 2003. The licensee failed to communicate that the motor feed pump (MFP) was to be protected as required by their online risk management strategy. As a result, the MFP was not posted as protected equipment in accordance with site policies and procedures nor, more significantly, was control room supervision aware that the MFP required such protection. Once the condition was brought to the attention of control room personnel, the area was immediately posted.

This finding was more than minor because it could reasonably be viewed as a precursor to a more significant event. Specifically, since the control room was unaware of the need to protect the MFP, the inspectors concluded that work on or near the MFP could have been authorized. Further, without the local posting and with the absence of the MFP on the promulgated list of protected systems, workers would not have questioned the

release of work on the MFP nor demonstrated heightened awareness when working in the area. In addition, had the MFP become unavailable, the plant's online risk configuration would have crossed the yellow to orange threshold. The finding was of very low safety significance because no work occurred to cause the MFP to become unavailable. (Section 1R13)

- Green. The inspectors identified a non-cited violation of Technical Specification 5.4, Procedures, for the licensee's failure to perform verification of component operability during system restoration following surveillance testing of the Division 2 remote shutdown system on September 9, 2003. While the licensee tested the capability of the system to control safe shutdown systems from outside the control room, the inspectors observed that the licensee failed to verify that control capability was returned to the control room prior to declaring systems and components operable. Specifically, the licensee failed to verify reestablishment of safety-related circuit continuity, such that the components could be operated from the control room during system restoration. The inspectors additionally noted that the licensee did not test the ability of the transfer switch to isolate the control circuitry from the control room.

This finding is greater than minor because it was associated with the mitigating system cornerstone attribute of equipment reliability and the finding is associated with the objective of ensuring operability, availability, reliability and function of the safety-related systems. The inspectors determined that the finding was of very low safety significance in accordance with the Significance Determination Process Phase 1 worksheet because the continuity of the safety-related circuitry was subsequently successfully demonstrated by other licensee surveillance procedures. Therefore, no actual loss of safety function occurred. (Section 1R22)

B. Licensee-Identified Violations

Two 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 are listed in Section 4OA7 of this report.

Report Details

Summary of Plant Status

The unit began the inspection period by reducing power on October 1 to 70 percent for a rod line adjustment. The unit returned to 100 percent power on October 2. The unit remained at or near 100 percent power until October 15 when power was reduced to 90 percent in response to the inadvertent opening of two safety/relief valves due to a spurious trip signal received during surveillance testing. The unit returned to 100 percent power on October 16. The unit remained at or near 100 percent power until November 19 when power was reduced to 60 percent for power suppression testing and a sequence exchange. The unit returned to 100 percent power on November 24. Power was reduced to 70 percent on November 25 for a rod pattern adjustment. The unit returned to 100 percent power on November 26 and remained at or near 100 percent power for the remainder of the inspection period.

REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1REP Equipment Availability and Functional Capability (71111.EP)

.1 Operability Evaluations

a. Inspection Scope

The inspectors selected condition reports (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 Technical Specifications (TSs) and Updated Safety Analysis Report (USAR) to the licensee's evaluations, to verify that the components or systems were operable. Where compensatory measures were required to maintain operability, the inspectors verified that the measures were in place, would work as intended, and were properly controlled. Additionally, the inspectors verified, where appropriate, compliance with bounding limitations associated with the evaluations. The inspectors reviewed:

- an operability determination associated with an oil leak from the lower bearing on the Division 1 emergency service water (ESW) pump motor completed on October 3;
- an immediate investigation on a main turbine alarm on October 10;
- an operability determination associated with indeterminate bolting hardware on a safety/relief valve completed on July 18;
- an operability determination on inadequate thread engagement on a reactor core isolation cooling joint completed on November 14;
- an operability determination on use of non-safety nuts in the nuclear closed cooling (NCC) system completed on November 20; and
- an operability determination associated with the environmental qualification of Division 2, Channel F low-low set Agastat relays.

b. Findings

No findings of significance were identified.

.2 Operator Workarounds (OWAs)

a. Inspection Scope

Semi-Annual Cumulative Review

The inspectors evaluated the overall effectiveness of the licensee OWA program on October 1. The inspectors reviewed the licensee's CRs, Operations Business Plan, and Operations Self-Assessment in order to determine if issues identified in these documents were also reviewed as part of and captured in the licensee's OWA program. Additionally, the inspectors discussed the effect of active OWAs with operators and operations management. The inspectors evaluated the interaction between the OWAs to determine if cumulative effects existed. The inspectors reviewed the licensee's plans to eliminate the need for the identified OWAs.

NCC Heat Exchanger Service Water Bypass Valve Failure to Close

During the week of October 20 the inspectors reviewed an OWA associated with the inability of the NCC heat exchanger bypass valve to close remotely or manually and to verify that the workaround was properly classified and dispositioned in accordance with the criteria of the licensee's procedure. Per design, the bypass valve should close upon a loss of offsite power (LOOP) event to maximize flow through the NCC exchangers. The inspectors verified the closure action was designed for an orderly shutdown of balance of plant equipment and not the safe shutdown of the reactor. The inspectors reviewed the adequacy of licensee actions to address the issue and evaluated the potential risk impacts to ensure that the workaround did not unduly impact the operators' ability to implement normal, abnormal, and emergency operating procedures.

b. Findings

No findings of significance were identified.

.3 Temporary Plant Modifications

a. Inspection Scope

During the week of October 20 the inspectors reviewed the temporary modification package associated with Temporary Modification 1-03-0026, "Suppression Pool Cooling Temporary Modification," to verify that the modification was properly installed, had no effect on the operability of the safety-related equipment, and met design basis requirements. The inspectors assessed the acceptability of the temporary modification to the facility by comparing the 10 CFR 50.59 screening evaluation and supporting operating procedures to the design basis documents and plant drawings. The inspectors also checked temporary modification tags, reviewed the modified suppression pool

cleanup operating procedure, reviewed the temporary system operating procedure, and walked down the system to ensure the temporary modification to the system did not impact the operability of interfacing systems.

b. Findings

No findings of significance were identified.

.4 Maintenance Effectiveness

a. Inspection Scope

The inspectors reviewed the licensee's implementation of the maintenance rule requirements to verify that component and equipment failures were identified and scoped within the maintenance rule and that select structures, systems, and components were properly categorized and classified as (a)(1) or (a)(2) in accordance with 10 CFR 50.65. The inspectors reviewed station logs, maintenance work orders, selected surveillance test procedures, and a sample of CRs to verify that 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 verify that the criteria adequately monitored equipment performance and to verify that licensee changes to performance criteria were reflected in the licensee's probabilistic risk assessment. During this inspection period the inspectors reviewed the following two areas:

- electrical components super function; and
- safety-related plant structures.

The problem identification and resolution CRs reviewed are listed in the attached List of Documents Reviewed.

b. Findings

No findings of significance were identified.

1R01 Adverse Weather Protection (71111.01)

a. Inspection Scope

During late October and early November the inspectors conducted plant walkdowns and document reviews to verify that systems and structures were adequately protected against impending cold weather. Specifically, the inspectors:

- conducted walkdowns of various plant structures and systems to check for maintenance or other apparent deficiencies which could affect system operations during cold weather;
- reviewed winter preparation repetitive task status;
- reviewed changes to winter preparation instructions;

- reviewed deficiencies identified during licensee walkdowns to verify deficient conditions were appropriately prioritized;
- verified space heaters were functional;
- reviewed severe weather Off-Normal Instructions (ONIs) to verify procedural adequacy; and
- discussed previous operational experience with the appropriate system engineers.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment (71111.04)

a. Inspection Scope

The inspectors conducted partial walkdowns of the systems listed below to verify that the systems were correctly aligned to perform their designed safety function. The inspectors used licensee valve lineup instructions (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 three systems:

- the Division 3 emergency diesel generator (EDG), on October 27 while the EDG was identified as risk significant due to unavailability of the diesel driven fire pump;
- RHR trains 'B' and 'C' on November 3 while RHR 'A' was inoperable due to a planned divisional outage; and
- the reactor core isolation cooling system on November 25 while the high pressure core spray (HPCS) system was inoperable due to a planned divisional outage.

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05Q)

a. Inspection Scope

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

- Fire Area 1CC-4b; Division 2 Cable Penetration Room;
- Fire Area 1CC-4f; Division 1 Cable Penetration Room;
- Fire Area 1CC-6; Control Complex Elevation 679'-6";
- Fire Area 1CC-3d; Remote Shutdown Room; and
- Fire Area 1CC-5a; Unit 1 Control Room.

Emphasis was placed on the 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 looked at fire hoses, sprinklers, and portable fire extinguishers to verify that 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 verify that they were in good physical condition. The documents listed at the end of the report were used by the inspectors during the assessment of this area.

b. Findings

No findings of significance were identified.

1R06 Flood Protection Measures (71111.06)

a. Inspection Scope

During the week of November 24 the inspectors reviewed design basis documentation concerning flooding of the 620' and 599' elevations of the auxiliary building. The inspectors compared USAR discussions of flooding on these levels with supporting calculations and field conditions to determine consistency. In addition, the inspectors performed walkdowns of both levels to verify the physical condition of flood control features and absence of material that could impede water removal from these areas.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification (71111.11)

.1 Quarterly Observation

a. Inspection Scope

On November 18 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 verify that the training staff had observed important performance deficiencies and specified appropriate remedial actions.

b. Findings

No findings of significance were identified.

.2 Annual Operating Test Results

a. Inspection Scope

The inspectors reviewed the overall pass/fail results of Job Performance Measure operating tests and simulator operating tests (required to be given per 10 CFR 55.59(a)(2)) administered by the licensee during calendar year 2003. The licensee completed the annual operating examination on December 12. The overall results were compared with the SDP in accordance with NRC IMC 0609, Appendix I, "Operator Requalification Human Performance Significance Determination Process (SDP)."

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 verify that scheduled and emergent work activities were adequately managed. In particular, the inspectors reviewed the licensee's program for conducting maintenance risk assessments to verify that the licensee's planning, risk management tools, and the assessment and management of online risk were adequate. The inspectors also reviewed licensee actions to address increased online 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 verify that the actions were accomplished when online risk was increased due to maintenance on risk-significant structures, systems, and components. The following five assessments and/or activities were reviewed:

- the maintenance risk assessment for the week of October 27 which included planned entries into an elevated risk profile due to planned maintenance on the diesel driven fire pump and the motor driven feed pump;
- the maintenance risk assessment and work execution associated with a planned Division 1 outage November 3 and 4 and subsequent Division 1 EDG allowed outage time maintenance activities;

- the maintenance risk assessment for the week of November 10 which included a planned entry into an elevated risk profile due to planned testing of the diesel driven fire pump;
- the maintenance risk assessment and work execution associated with a planned Division 3 outage November 18 and 19; and
- the maintenance risk assessment for the week of December 1 which included diesel generator governor tuning and load reject testing.

b. Findings

Introduction: The inspectors identified an NCV of 10 CFR 50.65(a)(4) for the licensee's failure to manage risk during a Division 1 outage. The licensee failed to communicate that the motor feed pump (MFP) was to be protected as required by their online risk management strategy. As a result, the MFP was not posted as protected equipment in accordance with site policies and procedures nor, more significantly, was control room supervision aware that the MFP required such protection.

Description: On November 3 the inspectors reviewed the licensee's planned maintenance activities and associated online maintenance risk profile. The inspectors paid particular attention to the licensee's identification of remaining systems having the greatest impact on risk. While conducting a walkdown of the identified systems, the inspectors identified that the licensee had not provided postings around the MFP. The inspectors knew that prior to taking Division 1 equipment out of service, the licensee's probabilistic safety assessment organization had identified the MFP as one of the remaining available systems having the greatest impact on risk.

The inspectors reviewed the licensee's communication of risk category and specific protected areas to plant personnel. The communication occurred both in the form of site-wide electronic mail and colored note cards distributed to plant personnel as they entered the protected area. Both the electronic mail and colored note cards were intended to heighten personnel awareness to the increased plant risk configuration. Despite properly identifying the MFP, the licensee failed to include the MFP in either form of plant-wide communication. As a result, plant personnel were not aware that the MFP required protection.

Most significantly, when the inspectors contacted the control room, shift supervisory personnel were not aware of the safety significance of the MFP in the current plant configuration. When the inspectors spoke with the control room staff, the staff reviewed the protected equipment posting log and the colored note card provided to employees to inform them of what systems must be protected. Since none of these documents indicated that the MFP should be protected, the control room staff contacted the Probabilistic Risk Assessment Group and confirmed that the MFP should be protected. Once the control room staff verified the need to protect the MFP, they posted the MFP as a protected train. The inspectors noted, that if the MFP became unavailable during the plant configuration established on November 3, the plant risk would have crossed a threshold from yellow to orange. The threshold corresponds to a Core Damage

Frequency (CDF) greater than or equal to ten times zero-maintenance CDF. Entry into such a configuration would have required Operations Manager and Plant Manager approval, as well as the establishment of compensatory measures.

The inspectors previously discussed other instances with the licensee where there was less than adequate communication of protected trains. For example, the inspectors previously noted that distributed cards identified the wrong division as protected. In other instances, risk significant systems were omitted. In these instances, corrections were either made prior to entering the elevated risk or control room personnel were aware of the proper set of protected trains and had posted them accordingly. Thus, the inspectors concluded these instances were minor. However, a review of the licensee's corrective action program indicated that these prior instances had not been entered into the program.

The inspectors also noted recent licensee performance issues with respect to online risk management. Examples included:

On September 8 the MFP was removed from service, per published work week schedule, to allow maintenance personnel to implement an engineering change proposal. Due to conflicting resource requirements associated with the Division 1 ESW pump the previous week, licensee maintenance personnel were unable to complete the required prefabrication work. Further they were not prepared to provide around-the-clock coverage. When the licensee's maintenance personnel realized the work could not be completed in a timely manner, the control room was promptly notified and the MFP was returned to service. The MFP was, however, unavailable for approximately 11 hours. The plant was unnecessarily in a Yellow risk configuration during that time period.

On October 27 the diesel fire pump (DFP) was removed from service to allow maintenance to replace the fuel oil pump. During performance of the work, licensee maintenance personnel determined, after removing the installed pump, that the replacement pump was not identical. After conversations with the vendor, the licensee determined that the wrong fuel pump had been supplied. The licensee reinstalled the old pump. The licensee then encountered additional delays returning the DFP to service due to inadequate planning for required maintenance runs. The post-maintenance activities, which were clearly identified in the governing work document but not the Perry Work Implementation Schedule, required instrumentation and control (I&C) personnel support and I&C equipment. Unnecessary system unavailability occurred because I&C was unaware their support was required and did not have calibrated instruments pre-staged. The net affect of the work activity was the DFP was unavailable for approximately 40 hours without the intended maintenance accomplished. The plant was unnecessarily in a Yellow risk configuration during that time period.

Analysis: This finding was more than minor because the inspectors concluded that it could reasonably be viewed as a precursor to a more significant event. Specifically, since the control room was unaware of the need to protect the MFP, the inspectors concluded that work on or near the MFP could have been authorized. Furthermore,

without the local posting and with the absence of the MFP on the promulgated list of protected systems, workers would not have questioned the release of work on the MFP nor demonstrated heightened awareness when working in the area. In addition, had the MFP become unavailable, the plant's online risk configuration would have crossed the yellow to orange threshold. Since no work occurred to cause the MFP to become unavailable, the inspectors determined the finding to be of very low safety significance in accordance with the SDP Phase 1 worksheets.

Enforcement: 10 CFR 50.65(a)(4) stated, in part, that "before performing maintenance activities (including but not limited to surveillance, post-maintenance testing, and corrective and preventative maintenance), the licensee shall assess and manage the increase in risk that may result from the proposed maintenance activities." Contrary to this requirement, the licensee failed to manage risk in that they did not communicate to site personnel, most notably control room supervisory personnel, that work on the MFP would adversely affect the risk profile during a Division 1 outage on November 3, 2003. The licensee's risk management strategy, as outlined in Perry Administrative Procedure-1924 (PAP-1924), "On-Line Safety Assessment," identified the protection of systems and the notification of personnel as part of that strategy during periods of elevated risk. Because the failure to manage risk was of very low safety significance and has been entered into the corrective action program (CR 03-06022), this violation is being treated as an NCV, consistent with Section VI.A of the NRC enforcement policy **(NCV-05000440/2003010-01)**.

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

.1 Opening of Two Safety/Relief Valves

a. Inspection Scope

On October 15 two safety/relief valves lifted during quarterly low-low set pressure actuation channel surveillance testing. The inspectors responded to the control room after a plant announcement was made to evacuate containment. The inspectors reviewed licensee immediate and supplemental actions. Specifically, the inspectors verified the licensee's actions were consistent with operating instructions, alarm response instructions, ONIs, and emergency instructions. The inspectors verified licensee actions were in accordance with TS requirements and reviewed the licensee's event classification. Finally, the inspectors attended plant restoration planning meetings and observed the restoration of the low-low set trip circuitry.

b. Findings

No findings of significance were identified.

.2 Fuel Defect Localization and Isolation

a. Inspection Scope

During the period of November 20-24, the inspectors observed licensee efforts to localize and isolate a fuel defect. The inspectors observed infrequently performed test or evolution briefings, pre-shift briefings, and reactivity control briefings to verify the briefings met criteria specified in the Perry Operations Section Expectations Handbook and PAP-1121, "Conduct of Infrequently Performed Tests of Evolutions," Rev. 1. Additionally, the inspectors observed test performance to verify that procedure use, crew communications, and coordination of activities between work groups similarly met established station expectations and standards.

b. Findings

No findings of significance were identified.

1R17 Permanent Plant Modifications (71111.17)

a. Inspection Scope

During the week of October 13 the inspectors reviewed the design change package and the work associated with elimination of the loose parts monitoring system to verify the accuracy of the design change and that the work was completed in accordance with the work package. The inspectors reviewed the regulatory applicability determination and 10 CFR 50.59 evaluation to determine if all current licensing basis and justifications were accurate. The inspectors reviewed impacted system operating instructions, alarm response procedures, and design drawings to verify appropriate changes were implemented. Finally, the inspectors discussed the impact of the system elimination with control room operators.

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 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 its operational status following testing. The inspectors evaluated the activities against TSs, the USAR, 10 CFR Part 50 requirements, licensee procedures, and various NRC generic communications. In addition, the inspectors reviewed CRs associated with post-maintenance testing to determine if 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 four post-maintenance activities were reviewed:

- turbine feed pump 'A' pressure switch testing following leak repair on October 2;
- breaker EH2114 testing after a cell switch adjustment completed on October 17;
- HPCS suppression pool high level instrumentation testing following capacitor replacement on October 20; and
- valve N27F0110 testing following replacement of capscrews on November 24.

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 TSs, 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 eight specific surveillance activities assessed were:

- Division 2 remote shutdown control testing conducted September 9;
- Division 1 EDG fuel transfer pump testing conducted October 7;
- HPCS ESW pump and valve operability testing conducted October 21;
- HPCS pump and valve operability testing conducted October 23;
- Division 1 EDG biennial testing conducted November 4-7;
- RHR 'B' timer testing conducted November 12;
- accident monitoring suppression pool water level instrumentation calibration conducted November 14; and
- electric and DFP controller and flow testing conducted November 20.

b. Findings

Introduction: The inspectors identified an NCV of TS 5.4, Procedures, for the licensee's failure to perform verification of component operability during system restoration following surveillance testing of the Division 2 remote shutdown system on September 9, 2003. While the licensee tested the capability of the system to control safe shutdown systems from outside the control room, the inspectors observed that the licensee failed to verify that control capability was returned to the control room prior to declaring systems and components operable. Specifically, the licensee failed to verify reestablishment of

safety-related circuit continuity, such that the components could be operated from the control room during system restoration. The inspectors additionally noted that the licensee did not test the ability of the transfer switch to isolate the control circuitry from the control room.

Description: On September 9 the licensee performed testing of the Division 2 remote shutdown system to satisfy TS surveillance requirement 3.3.3.2.2. This surveillance requirement required the licensee to “verify each required control circuit and transfer switch is capable of performing the intended functions.” The test performed by the licensee verified operation of contacts to confirm that the local switch would cause each of the tested components to respond from the remote location. The inspectors reviewed the procedure and the circuit drawings to confirm that the tests performed verified the intended functions of the transfer switch. During this review, the inspectors concluded that the test did not demonstrate the isolation of the control circuit from the control room. Specifically, the test did not require the licensee to attempt to start components from the control room nor did it require verification that contacts which would provide such isolation changed state. Conversations with the licensee confirmed that the control room isolation function was not tested in this surveillance and that no other surveillance existed to test the function. The licensee initiated corrective action to revise the surveillance procedure to include verification of control room isolation.

Additional review by regional inspectors identified that, contrary to the requirements of Generic Letter 96-01, “Testing of Safety-Related Logic Circuits,” reestablishment of safety-related circuit continuity during system restoration was not verified. In other words, when the transfer switch was returned to the “normal” position, the licensee did not verify that the necessary contacts changed state to return control of the component to the control room. The licensee informed the inspectors that the continuity of the safety-related circuitry was subsequently verified during quarterly pump and valve testing for the affected components, and that as such, no immediate safety concern existed, but concurred the continuity should be verified prior to declaring the affected component operable. The licensee initiated corrective action to revise the surveillance procedure to verify the appropriate contacts change state prior to declaring the affected component operable.

Analysis: This finding is greater than minor because it was associated with the mitigating system cornerstone attribute of equipment reliability and the finding is associated with the objective of ensuring operability, availability, reliability and function of the safety-related systems. The inspectors determined that the finding was of very low safety significance in accordance with the SDP Phase 1 worksheet because the continuity of the safety-related circuitry was subsequently successfully demonstrated by other licensee surveillance procedures. Therefore, no actual loss of safety function occurred.

Enforcement: Technical Specification 5.4 states, in part, that procedures shall be established, implemented and maintained as recommended in Regulatory Guide 1.33. Regulatory Guide 1.33 recommended the establishment of written procedures, appropriate to the circumstances, for surveillance testing of emergency core cooling systems. Contrary to this requirement, the licensee failed to establish a written procedure appropriate to the circumstances for surveillance testing of the Division 2

remote shutdown system. Specifically, the licensee did not verify component operability during system restoration. Because of the very low safety significance and because the issue has been entered into the licensee's corrective action program (CR 03-06493), the issue is being treated as an NCV consistent with Section VI.A.1 of the NRC Enforcement Policy (**NCV 05000440/2003010-02**).

1EP6 Drill Evaluation (71114.06)

a. Inspection Scope

The inspectors observed the simulator control room, backup offsite emergency operations facility, and the operations support center during an emergency preparedness drill conducted on November 13. 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.

b. Findings

No findings of significance were identified.

2. **RADIATION SAFETY**

Cornerstone: Occupational Radiation Safety

2OS1 Access Control to Radiologically Significant Areas (71121.01)

a. Inspection Scope

The inspectors conducted walkdowns of the radiologically protected area to verify the adequacy of radiological area boundaries and postings. Specifically, the inspectors walked down radiologically significant work area boundaries (high and locked high radiation areas) in the Containment, Intermediate, and Fuel Handling Buildings and performed confirmatory radiation measurements to determine if these areas were properly posted and controlled in accordance with 10 CFR Part 20, licensee procedures, and TSs. The inspectors also evaluated the radiological conditions of those areas walked down to assess radiological housekeeping and contamination controls.

The inspectors reviewed radiation work permits and radiological work packages and performed job site observations for selected work involving elevated and changing radiological conditions to verify that radiological controls would minimize worker dose. These controls included radiation protection job coverage, both direct and remote, surveys, contamination controls, and high radiation job briefings.

b. Findings

No findings of significance were identified.

2OS3 Radiation Monitoring Instrumentation and Protective Equipment (71121.03)

.1 Inspection Planning

a. Inspection Scope

The inspectors reviewed the plant USAR to identify applicable radiation monitors associated with transient high and very high radiation areas including those used in remote emergency assessment. This represents one sample. The inspectors also identified various types of portable radiation detection instrumentation used for job coverage of high radiation area work, and other temporary area radiation monitors currently used in the plant, including continuous air monitors associated with jobs with the potential for workers to receive 50 millirem committed effective dose equivalent (CEDE). Whole body counters and radiation detection instruments utilized for personnel survey and release from the radiologically controlled area were identified. This represents one sample.

Licensee personnel were observed performing calibration and source checks of selected instruments. The inspectors verified current calibration records, operability, and alarm set points (where applicable) of selected instruments including accident range radiation monitors, portable hand-held survey instruments, and personnel monitoring devices. This included an evaluation of operating parameters for instrumentation used for the release of personnel and material from the radiologically restricted area to verify that detection limits were based on adequate count times and low radiological backgrounds so that the typical instrument sensitivities were achieved. Instrumentation reviewed included, but was not limited to, the following:

- PTI-D21-P3000; Area Radiation Monitor System 1D21N080 Upper Pool Area;
- PTI-D21-P3000; Area Radiation Monitor System 1D21N060 TIP Drive Area;
- PTI-D17-P1670; Drywell Atmosphere Radiation Monitor;
- PTI-D17-P1680; Containment Atmosphere Radiation Monitor;
- Gamma 60 Monitor;
- Eberline RM-20;
- Eberline RO2A;
- Eberline RO20;
- Eberline PCM1B;
- AMP 100;
- Fastscan Whole Body Counter L70L600A;
- Bicron Analyst;
- Lapel Air Sampler HFS 113A-T;
- SAM-9 Tool Monitor;
- AMS-4 Continuous Air Monitor;
- Eberline ASP-2 REM Ball;
- Eberline Teletector; and
- Electronic Dosimeters.

The inspectors reviewed what actions would be taken when, during calibration or source checks, an instrument was found out of calibration by more than 50 percent. Should that occur, the inspectors verified that the licensee's actions would include a determination of

the instrument's previous usages and the possible consequences of that use since the last calibration. The inspectors also reviewed the licensee's 10 CFR Part 61 source term analyses to determine if the calibration sources used were representative of the plant source term and that hard to detect nuclides were scaled into whole body count dose determinations. This represents one sample.

b. Findings

No findings of significance were identified.

.2 Problem Identification and Resolution for Radiation Monitoring Instrumentation and Protective Equipment

a. Inspection Scope

The inspectors reviewed the licensee's self-assessments, audits, CRs, licensee event reports, and special reports that involved personnel contamination monitor alarms due to personnel internal exposures to verify that identified problems were entered into the corrective action program for resolution. Internal exposure occurrences greater than 50 millirem CEDE were reviewed to determine if the affected personnel were properly monitored utilizing calibrated equipment, if the data was adequately analyzed, and if internal exposures were properly assessed in accordance with licensee procedures. Licensee audit and assessment data were also evaluated to verify that deficiencies and problems with radiation protection instrumentation were identified, characterized, prioritized, and resolved using the corrective action program. This represents one sample.

The inspectors reviewed corrective action program reports related to exposure significant radiological incidents that involved radiation monitoring instrument deficiencies since the last inspection in this area. Staff members were interviewed and corrective action documents were reviewed to verify that the following activities were being conducted in an effective and timely manner commensurate with their importance to safety and risk. Items reviewed included:

- 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 represents one sample.

The inspectors verified that the licensee's self-assessment process identified and addressed repetitive deficiencies or significant individual deficiencies that were identified in problem identification and resolution. This represents one sample.

b. Findings

No findings of significance were identified.

.3 Radiation Protection Technician Instrument Use

a. Inspection Scope

The inspectors verified that instrument calibrations had not lapsed, reviewed source response check data records on radiation detection instruments staged for use, and observed radiation protection technicians for appropriate instrument selection and self-verification of instrument operability prior to use. This represents one sample.

b. Findings

No findings of significance were identified.

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

a. Inspection Scope

Based on requirements contained in the USAR, TSs, and plant procedures, 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 verified that control room operators and other emergency response and radiation protection personnel were trained and qualified in the use of SCBAs including personal bottle change-out. This included verification that licensee personnel were trained and qualified to refill air bottles. The inspectors also verified 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 represents one sample.

The inspectors reviewed the SCBA manufacturer's maintenance training certifications for licensee personnel qualified to perform SCBA maintenance and verified the qualifications of three SCBA units currently designated as "ready for service." Maintenance records for the past 5 years for work performed by certified licensee personnel and by qualified vendors on this equipment were reviewed. This included vital component maintenance records for the regulator and low pressure alarm. Maintenance records along with monthly surveillance data for selected SCBA units and spare air bottles, covering the period since the last inspection of this area, were reviewed to verify that the required maintenance and surveillances had been performed. The licensee was developing a process for contracting all vital component maintenance to qualified vendors. The inspectors also ensured that the required periodic air cylinder hydrostatic testing was documented, up to date, and that the Department of Transportation required retest air cylinder markings were in place for the three identified SCBA units, as well as other selected SCBA units and spare bottles. The inspectors reviewed the licensee's maintenance procedures, including those for the low pressure alarm and regulator, along

with the SCBA manufacturer's recommended practices to determine if there were inconsistencies between them. The inspectors also observed licensee staff inspect and refill air bottles to verify compliance with those procedures. This represents one sample.

b. Findings

No findings of significance were identified.

Cornerstone: Public Radiation Safety

2PS1 Radioactive Gaseous and Liquid Effluent Treatment and Monitoring Systems (71122.01)

a. Inspection Scope

During the NRC inspection documented in Inspection Report No. 05000440/2002006 (formerly identified as IR 05000440-02-06) and the current inspection, the inspectors reviewed the licensee's corrective action program including quality assurance audits, self-assessments, special reports, and CRs to verify that problems were identified in a timely manner and were entered into the corrective action program for resolution and that the licensee met the requirements of 10 CFR 20.1101(c) and the Radiological Environmental TSs/Offsite Dose Calculation Manual (RETS/ODCM). The review was also performed to determine that the licensee's self assessment program had identified and addressed repetitive deficiencies or significant individual deficiencies that were identified in problem identification and resolution.

Condition reports were reviewed for indications of abnormal releases or releases made with inoperable effluent radiation monitors to verify that adequate compensatory sampling was performed at frequencies defined by the RETS/ODCM. This data was also reviewed to verify that for any unmonitored releases the licensee performed an adequate evaluation of the type and amount of radioactive material released and the projected dose to the public.

The inspectors also reviewed CRs and corrective action reports from the radioactive effluent treatment and monitoring program, interviewed staff, and reviewed documents to determine if the follow-up activities were being conducted in an effective and timely manner commensurate with their importance to safety and risk. Items reviewed included:

- 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.

b. Findings

No findings of significance were identified.

2PS2 Radioactive Material Processing and Transportation (71122.02)

a. Inspection Scope

During the NRC inspection documented in Inspection Report No. 05000440/2003006 and the current inspection, the inspectors reviewed the environmental monitoring report for the year 2002 for information on the types and amounts of radiological wastes released or disposed of. Changes to the radwaste processing system, since the previous inspection of this area, were evaluated for any radiological dose impact to the public and to verify that the licensee had reviewed and documented these changes in accordance with 10 CFR 50.59. The inspectors also verified that licensed facilities receiving radwaste material from the licensee were authorized to receive the shipment packages.

b. Findings

No findings of significance were identified.

2PS3 Radiological Environmental Monitoring Program (REMP) and Radioactive Material Control Program (71122.03)

a. Inspection Scope

During the NRC inspection documented in Inspection Report No. 05000440/2002005 (formerly identified as IR 05000440-02-05) and the current inspection, the inspectors reviewed the licensee's corrective action program including quality assurance audits, self assessments, special reports and CRs to verify that problems were identified in a timely manner, were entered into the corrective action program for resolution and that the REMP met the requirements of 10 CFR 20.1101(c) and the RETS/ODCM. The review was also performed to determine that the licensee's self assessment program had identified and addressed repetitive deficiencies or significant individual deficiencies that were identified in problem identification and resolution.

The inspectors also reviewed corrective action reports from the REMP including sampling, analysis, and meteorological monitoring instrumentation, 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. Items reviewed were:

- 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.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151)

.1 Reactor Safety Strategic Area

a. Inspection Scope

The inspectors sampled the licensee's submittals for performance indicators (PIs) listed below. The inspectors used PI definitions and guidance contained in Revision 2 of Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," to verify the accuracy of the PI data. The following PIs were reviewed:

- reactor coolant system specific activity;
- emergency AC power system unavailability; and
- scrams with loss of normal heat removal.

The inspectors reviewed station logs, CRs, TS logs, and surveillance procedures to verify the accuracy of the licensee's data submission. The inspectors reviewed Chemistry Department records and selected isotopic analyses (October 2002 through November 2003) to verify that the greatest Dose Equivalent Iodine (DEI) values obtained during those months corresponded with the values reported to the NRC. The inspectors also reviewed selected DEI calculations to verify that the appropriate conversion factors were used in the assessment as required by TSs. Additionally, the inspectors observed a chemistry technician obtain and analyze a reactor coolant sample for DEI to verify adherence with licensee procedures for the collection and analysis of reactor coolant system samples.

b. Findings

No findings of significance were identified.

.2 Radiation Safety Strategic Area

a. Inspection Scope

The inspectors sampled the licensee's submittals for PIs and periods listed below. The inspectors used PI definitions and guidance contained in Revision 2 of Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," to verify 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, conducted walkdowns of accessible locked high radiation area entrances to verify the adequacy of controls in place for these areas, and discussed PI data collection and analyses methods with licensee representatives to verify that there were no unaccounted for occurrences in the Occupational Radiation Safety PI as defined in Revision 2 of Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline."

- **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 and selected CRs generated over 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 2 of Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline."

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems (71152)

.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 verify that 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.

b. Findings

No findings of significance were identified.

.2 Annual Sample Review

a. Inspection Scope

The inspectors reviewed the licensee's root cause analysis and corrective actions for low discharge pressure on the RHR 'A' and LPCS common waterleg pump which occurred on August 14, 2003. Specifically, the inspectors reviewed the licensee's determination of past system operability and the degree to which procedural inadequacies contributed to the failure of the waterleg pump.

b. Findings

(Closed) URI 05000440/2003009-01: Review of Low Pressure Core Spray/Residual Heat Removal 'A' Waterleg Pump Operability Prior to the August 14, 2003, Loss of Offsite Power

Introduction: A self-revealed apparent violation (AV) of TS 5.4 occurred on August 14 when the waterleg pump for the LPCS and RHR 'A' systems failed to provide adequate discharge pressure after a LOOP event. After the EDGs restored power to the emergency busses, the waterleg pump restarted, but did not provide adequate discharge pressure. Subsequent evaluation revealed that the pump had become air bound due to failure to completely vent the affected systems on a periodic basis. The NRC assessed this finding in accordance with IMC 0609 and made a preliminary determination that it is an issue with some increased importance to safety.

Description: Following the August 14 LOOP, the waterleg pump for the LPCS and RHR 'A' systems restarted but did not provide adequate discharge pressure. Approximately 5 hours after the LOOP, licensee personnel vented the pump casing which allowed trapped air to escape and water to enter the pump casing. The pump then provided the expected discharge pressure.

While investigating the cause of the pump air binding, the licensee's root cause team developed a theory concerning gas accumulation in the vertical section of the feedwater leakage control system piping due to the waterleg pump stripping gasses from solution. The licensee theorized that gasses collected in the vertical piping and remained pressurized at approximately 44 psig. When the pump lost power, the pressure dropped, thus allowing the gas bubble to expand and void a large portion of the waterleg pump piping. The licensee validated the theory on September 10 when a substantial quantity of gas was vented from the piping. The licensee determined that the quantity of gas vented would have been more than sufficient to re-bind the pump had another LOOP occurred.

The licensee's root cause concluded that design of the system resulted in the gas accumulation since the piping included a vertical section leading to the high point immediately after the waterleg pump. This arrangement provided a location for gasses stripped from solution to accumulate rather than re-enter solution. However, the inspectors noted that the system design included a high point vent valve, that if used during the licensee's monthly venting, would have maintained system operability.

Analysis: The inspectors evaluated this finding under the SDP. The inspectors concluded that this finding directly effected the mitigating system cornerstone objective of safety system availability. The inspectors evaluated the finding under Phase 1 of the SDP process and determined a Phase 2 analysis was needed. The inspectors based this conclusion on the loss of the LPCS and RHR 'A' during some accident scenarios. The inspectors determined that without the waterleg pump available to maintain LPCS and RHR 'A' discharge piping pressurized, the potential existed for void formation. If voiding occurred and the LPCS and/or RHR 'A' pumps were subsequently started, a water hammer event could cause the piping in the systems to rupture. Since the condition existed for the entire life of the plant and gas accumulation would allow air binding to occur an estimated 30 days following a high point vent, the inspectors concluded the exposure time was greater than 30 days.

The initial Phase 2 risk assessment characterized this finding as White using the site specific Risk-Informed Inspection Notebook. Further review by the Senior Risk Analyst (SRA) under a Phase 3 analysis supported this conclusion. The SRA evaluated the change in CDF and Large Early Release fraction using the Standardized Plant Analysis of Risk model with updates applied from NUREG/CR 5496.

Enforcement: Technical Specification 5.4 states, in part, that procedures shall be established, implemented and maintained as recommended in Regulatory Guide 1.33. Regulatory Guide 1.33 recommended the establishment of written procedures for venting of emergency core cooling systems. Contrary to this requirement, the licensee failed to establish written procedures to periodically vent the high point on the discharge of the waterleg pump for LPCS and RHR 'A,' thus allowing sufficient gas to accumulate to cause system inoperability. Pending determination of the finding's significance, this finding is identified as **AV 05000440/2003010-03**. The licensee has entered this violation into its corrective action program as CR 03-04764.

4OA3 Event Followup (71153)

- .1 **(Closed) Licensee Event Report (LER) 05000440/2003-003-00:** Unrecognized Diesel Generator Inoperability. On August 21 the Division 1 diesel generator failed its monthly surveillance. Subsequent investigation revealed that following a LOOP, the licensee failed to ensure diesel generator output voltage was properly adjusted after the diesel tripped on reverse power while being paralleled with offsite power. After the failed surveillance, the licensee properly adjusted voltage and successfully tested the diesel generator. During the period of diesel generator inoperability, the licensee performed two mode changes. The inspectors previously reviewed this event as part of a special inspection (NRC Inspection Report 05000440/2003009). The LER did not identify any new performance deficiencies. This LER is closed.
- .2 **(Closed) LER 05000440/2002-002-01:** Failure of High Pressure Core Spray Pump to Start. On October 23, 2002, the licensee attempted to start the HPCS pump to perform testing of the HPCS room cooler. Licensee investigation revealed that the failure occurred due to an improperly aligned cell switch that provided a start permissive for the pump. A supplemental report revised the root cause determination, updated corrective action status, and specified additional actions identified during a revised extent of condition review. The inspectors previously identified a performance deficiency

concerning procedure implementation that was documented in Inspection Report 05000440/2002008 (previously identified as 50-440/02-08). The inspectors also previously identified a performance deficiency concerning the licensee's initial extent of condition review that was documented in inspection report 05000440/2003007. The supplement did not identify any new performance deficiencies. This LER is closed.

- .3 **(Closed) LER 05000440/2003-002-00:** Reactor Scram as a Result of Loss of Offsite Power. On August 14, 2003, the Perry Nuclear Power Plant scrambled as a result of a LOOP. The scram was a direct result of turbine control valve fast closure due to a generator trip due to an under-frequency condition attributable to the LOOP. The inspectors reviewed the LER and determined that all reportable conditions associated with the waterleg pump air binding were not captured, nor was the safety significance of air binding comprehensively evaluated. Additionally, the inspectors determined the root cause of the air binding to be substantially different than the root cause of the primary subject of the LER and as such should be addressed in a separate LER. The licensee had intended to submit a supplemental report when the impact of the waterleg pump air binding was "confirmed in PPNPs corrective action program." The licensee subsequently submitted the supplemental report which adequately addressed the inspector's concerns. As a result, this LER is closed.
- .4 **(Closed) LER 05000440/2003-002-01:** Reactor Scram as a Result of Loss of Offsite Power. On August 14, 2003, the Perry Nuclear Power Plant scrambled as a result of a LOOP. The scram was a direct result of turbine control valve fast closure due to a generator trip due to an under-frequency condition attributable to the LOOP. The supplement documented the licensee's decision to submit a separate LER for the air binding of the waterleg pump during the LOOP event. The safety analysis of the issue will be included in that LER. The supplement also corrected an error concerning the number of HPCS injections during the event. The supplement identified no new performance deficiencies. This LER is closed.

4OA6 Meetings

.1 Exit Meeting

The inspectors presented the inspection results to Mr. W. Kanda, Site Vice President, and other members of licensee management at the conclusion of the inspection on January 8, 2004. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified

.2 Interim Exit Meeting

Interim exits was conducted for:

- Licensed Operator Requalification 71111.11B with Mr. R. Gimberling on December 29, 2003, via telephone.

- Radiological monitoring instrumentation and aspects of radiological access control, radioactive effluents, radwaste/transportation and the radiological environmental monitoring programs with Mr. T. Rausch on December 12, 2003.

.3 Re-Exit Meeting

The inspectors re-exited with Mr. T. Rausch on January 22, 2004, to present the preliminary significance determination of the LPCS/RHR 'A' waterleg pump issue.

4OA7 Licensee-Identified Violations

The following violations of very low safety significance 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: Mitigating Systems

Technical Specification 5.4 requires that procedures be developed and implemented for operation of the ESW. Contrary to this requirement, on November 17 the licensee failed to follow procedures for operation of the ESW and opened the sluice gates without aligning the discharge to the swale. The configuration resulted in the licensee declaring all divisions of ESW inoperable and unplanned entries into TS 3.3.3.1, TS 3.5.1, TS 3.5.3, TS 3.6.1.7, TS 3.6.2.3, TS 3.6.3.3, TS 3.7.4, TS 3.7.10, and TS 3.8.1. The licensee recognized the error approximately five minutes after establishing the configuration. The licensee established the appropriate discharge path to the swale within five minutes of recognizing the error. The inspectors concluded this violation was of very low safety significance because no actual loss of safety function occurred. This conclusion was based on the short duration in the configuration and the licensee's subsequent analysis that with the lake temperature of 58 degrees F several hours were available for operator action should emergency operation of the ESW been required.

Cornerstone: Barrier Integrity

Technical Specification 5.4 requires that maintenance that can affect the performance of safety-related equipment be properly pre-planned and performed in accordance with written procedures, documented instructions, or drawings appropriate to the circumstances. Contrary to this requirement, on November 18 the licensee downpowered containment isolation valves 1D23F0050 and 1G43F0060 in the open position during a planned Division 3 maintenance outage. The action resulted in an unplanned entry into TS 3.6.1.3, Primary Containment Isolation Valves. The licensee exited the 12-hour shutdown statement after the penetrations were isolated by closing manual isolation valves. The licensee's investigation determined lack of sufficient procedural guidance to be the apparent cause of the event. The inspectors determined the violation to be of very low safety significance consistent with Table 3 of Appendix H of NRC IMC 0609.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

W. Kanda, Vice President-Nuclear
R. Coad, Radiation Protection Manager
R. Gimberling, Acting Operations Requalification Training Supervisor
V. Higaki, Manager, Regulatory Affairs
T. Lentz, Director, Nuclear Engineering
T. Rausch, General Manager, Nuclear Power Plant Department
R. Strohl, Superintendent, Plant Operations

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

05000440/2003010-03	AV	Inadequate LPCS/RHR 'A' Fill And Vent Procedures Results In System Inoperability After Loss of Offsite Power (Section 4AO2.2)
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Opened and Closed

05000440/2003010-01	NCV	Failure To Communicate That The Motor Feed Pump Was To Be Protected As Required By Online Risk Management Strategy (Section 1R12)
05000440/2003010-02	NCV	Failure To Verify Component Operability During System Restoration Following Remote Shutdown System Surveillance Testing (Section 1R22)

Closed

05000440/2002-002-01	LER	Failure of High Pressure Core Spray Pump to Start
05000440/2003-002-00	LER	Reactor Scram as a Result of Loss of Offsite Power
05000440/2003-002-01	LER	Reactor Scram as a Result of Loss of Offsite Power
05000440/2003-003-00	LER	Unrecognized Diesel Generator Inoperability
05000440/2003009-01	URI	Review of Low Pressure Core Spray/Residual Heat Removal 'A' Waterleg Pump Operability Prior to the August 14, 2003, Loss of Offsite Power

LIST OF DOCUMENTS REVIEWED

1REP Equipment Availability and Functional Capability

Operator Work Around Log; dated October 1, 2003

Plant Operations Section 2003 Business Plan; Rev. 2

PNPP Operations Section Self-Evaluation Report, First and Second Quarter 2003; dated July 30, 2003

System Health Report; Second Quarter 2003

System Health Report; Third Quarter 2003

Maintenance Rule Database; Rev. 5.06

M&C.-14; Work Around Policy; dated February 15, 2000

USAR Section 9.2.7; Service Water System

Operations Daily Instruction; dated October 20, 2003

CR 03-05676; Main Turbine Anomaly; dated October 9, 2003

CR 03-05514; RFA CR For the Addition of Oil to the A ESW Pump; dated September 30, 2003

CR 03-05487; P41F0400 Failed to Close; dated September 28, 2003

CR 03-06465; SRV Lo-Lo Set Logic Channel F (1B21C) Relays Appear to Have Exceeded EQ Life; dated December 3, 2003

TXI-0357; Operation of Temporary Suppression Pool Cooling System; Rev. 6

Drawing; Temp. Mod - Suppression Pool Cooling; Rev. 4

TM 1-03-0026; Suppression Pool Cooling Temporary Modification; Rev. 0

Regulatory Applicability Determination 03-01504; Temporary Modification to Add Suppression Pool Cooling Through Suppression Pool Cleanup; Rev. 0

10 CFR 50.59 Screen; Temporary Modification to Add Suppression Pool Cooling Through Suppression Pool Cleanup; Rev. 0

NUREG-1522; Assessment of Inservice Conditions of Safety-Related Nuclear Plant Structures; dated June, 1995

TAI-0513; Monitoring the Effectiveness of Maintenance Structure Monitoring Program; Rev. 2

EMARP-0006; Monitoring the Settlement or Rebound of Safety Class Structures; Rev. 2

EMARP-0011; Emergency Service Water System Monitoring Program; Rev. 3

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1R01 Adverse Weather Protection

PTI-GEN-P0026; Preparations For Winter Operation; Rev. 0

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ONI-ZZZ-1; Tornado or High Winds; Rev. 3

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1R04 Equipment Alignment

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DWG 302-0632; Reactor Core Isolation Cooling; Rev. HH

1R05 Fire Protection

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USAR 9A.4.4.4.1.2; Fire Area 1CC-4b

USAR 9A.4.4.4.1.6; Fire Area 1CC-4f

USAR 9A.4.4.5.1.1; Fire Area 1CC-5a

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1R06 Flood Protection Measures

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1R13 Maintenance Risk Assessments and Emergent Work Control

PAP-1924; On-line Safety and Configuration Risk Management; Rev.3

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Week 6, Period 3 Risk Profile

Week 7, Period 3 Risk Profile

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Division 1 Outage & AOT Schedule; dated October 27, 2003

CR 03-05151; Work Group Not Prepared to Perform Modification to Motor Feed Pump; dated September 8, 2003

CR 03-05635; Breakdown of Operational Focus; dated October 7, 2003

CR 03-05758; P54 Yellow Risk/ Twice in 5 Week Period; dated October 16, 2003

CR 03-05941; RFA - Replacement Pump Incorrect; dated October 28, 2003

CR 03-05943; Unscheduled Maintenance Run For DFP Delayed Return to Green Risk; dated October 28, 2003

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CR 03-06022; Discrepancy Between Risk Card and PWIS PSA Protected Lists; dated November 3, 2003

1R14 Operator Performance During Nonroutine Plant Evolutions and Events

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ONI-D51; Earthquake; Rev. 5

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TS 3.6.1.6; Low-Low Set (LLS) Valves

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1R17 Permanent Plant Modifications

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IOI-2; Hot Startup; Rev. 9

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1R19 Post-Maintenance Testing

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WO 200000488; Capacitor C25 Suspect to Fail; Rev. 1

CR 02-04585; Error Precursor- Potential Incorrect ORM Interpretation; dated December 4, 2002

ICI-B21-1; Rosemount Master Trip Unit (510DU) and (710DU); Rev. 4

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1R22 Surveillance Testing

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LCO 3.3.3.2; Remote Shutdown System

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T.S 5.5.6; Inservice Testing Program

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SVI-E22-T2001; HPCS Pump and Valve Operability Test; Rev. 15

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1EP6 Drill Evaluation

Perry Nuclear Power Plant 2003 ERO Team "A" Drill

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2OS1 Access Control to Radiologically Significant Areas

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2OS3 Radiation Monitoring Instrumentation and Protective Equipment

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AMS-4 Continuous Air Monitor S/N 7146-23 Calibration; dated November 15, 2003

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TMP-2001; NRC Licensed Operator Training Program Certifications; Revision 9

MSA SCBA Repair Technician Certification Through May 2005; dated May 7, 2002

Respiration Protection Equipment History S/N RG085098; Revision 9

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Respiration Protection Equipment History S/N RE101155; Revision 9

SCBA Inspections: Units 045, 028, 096, 086 and 030; dated September 15, 2003

PY-C-03-03: NQA Quarterly Audit Report; dated November 26, 2003

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CR03-03777; Collective Significance Review: RP Equipment Issue; dated June 7, 2003

CR03-03859; Procedure Error: Gamma 60 Portal Monitor Use; dated June 12, 2003

CR03-04365; MG Failure; dated July 23, 2003

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CR03-04843; Survey Meter Failed During Shipment Survey; dated August 19, 2003

CR03-05050; Meter Failure During Survey; dated August 29, 2003

CR03-05148; Review RP Instrumentation Condition Reports For Potential Trends; dated September 8, 2003

CR03-05258; MG Would Not Transmit With Telemetry; dated September 15, 2003

CR03-05306; RP Survey Meter Found With Water Inside; dated September 16, 2003

CR03-05569; Worker Entered U-2 FHB Twice, MG On Pause; dated October 2, 2003

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2PS1 Radioactive Gaseous and Liquid Effluent Treatment and Monitoring Systems

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2PS2 Radioactive Material Processing and Transportation

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2PS3 Radiological Environmental Monitoring Program (REMP) And Radioactive Material Control Program

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4OA1 Performance Indicator Verification

Plant Narrative Logs; January 1, 2003 through September 30, 2003

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Engineering system unavailability tracking logs; second quarter 2003

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40A2 Identification and Resolution of Problems

CR 03-04912; Division 1 Diesel Generator Failed SVI-R43-T1317 Run; dated August 21, 2003

CR 03-05307; Past Operability for LPCS/RHR 'A' Waterleg Pump 1E21C0002; dated September 19, 2003

CR 03-04764; RHR 'A'/LPCS, not Supplying Adequate Pressure; dated August 14, 2003

SVI-E21-T1181; LPCS Venting and Valve Line Up; Rev. 5

ARI-H13-P601-21; LPCS Pump Discharge Press Lo; Rev. 5

ARI-H13-P601-20; RHR Pump A Discharge Pressure Hi/Lo; Rev. 5

SOI-R43; Division 1 and Division 2 Diesel Generator System; Rev. 10

LIST OF ACRONYMS USED

°F	degrees Fahrenheit
CDF	core damage frequency
CEDE	Committed Effective Dose Equivalent
CFR	<u>Code of Federal Regulations</u>
CR	condition report
DEI	Dose Equivalent Iodine
DFP	diesel fire pump
EDG	emergency diesel generator
ESW	emergency service water
FENOC	FirstEnergy Nuclear Operating Company
HPCS	high pressure core spray
I&C	instrument and control
IMC	Inspection Manual Chapter
LER	licensee event report
LOOP	loss of offsite power
LPCS	low pressure core spray
MFP	motor feed pump
NCC	nuclear closed cooling
NCV	Non-cited violation
NRC	Nuclear Regulatory Commission
ONI	Off-Normal Instruction
OWA	operator workaround
PAP	Perry Administrative Procedure
PI	Performance Indicator
psig	pounds per square inch gauge
REMP	Radiological Environmental Monitoring Program
RETS/ODCM	Radiological Environmental Technical Specifications/Offsite Dose Calculation Manual
RHR	residual heat removal
SCBA	self-contained breathing apparatus
SRA	Senior Risk Analyst
SDP	significance determination process
SVI	surveillance instruction
TS	Technical Specification
USAR	Updated Safety Analysis Report
VLI	valve lineup instruction