

October 26, 2007

Mr. Barry S. Allen
Site Vice President
FirstEnergy Nuclear Operating Company
Perry Nuclear Power Plant
P. O. Box 97, 10 Center Road, A-PY-290
Perry, OH 44081-0097

SUBJECT: PERRY NUCLEAR POWER PLANT NRC INTEGRATED
INSPECTION REPORT 05000440/2007004

Dear Mr. Allen:

On September 30, 2007, 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 10, 2007, 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, it has been determined that Perry is in the Regulatory Response column of the Action Matrix (as outlined in our letter to you of May 8, 2007). In August 2007, the NRC reviewed Perry operational performance, inspection findings, and performance indicators for the second quarter of 2007. Based on this review, we concluded that Perry was 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, one finding of very low safety significance, which involved a violation of NRC requirements, was identified. However, because of its very low safety significance and because it have been entered into your corrective action program, the NRC is treating this violation as a non-cited violation (NCV) in accordance with Section VI.A.1 of the NRC's Enforcement Policy.

If you contest the subject or severity of this NCV, 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.

B. Allen

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Sincerely,

/RA/

Bruce L. Burgess, Chief
Branch 6
Division of Reactor

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

Enclosure: Inspection Report 05000440/2007004
w/Attachment: Supplemental Information

cc w/encl: J. Hagan, President and Chief Nuclear Officer - FENOC
J. Lash, Senior Vice President of Operations and
Chief Operating Officer - FENOC
D. Pace, Senior Vice President, Fleet Engineering - FENOC
J. Rinckel, Vice President, Fleet Oversight - FENOC
R. Anderson, Vice President, Nuclear Support - FENOC
Director, Fleet Regulatory Affairs - FENOC
Manager, Fleet Licensing - FENOC
Manager, Site Regulatory Compliance - FENOC
D. Jenkins, Attorney, FirstEnergy Corp.
Public Utilities Commission of Ohio
Ohio State Liaison Officer
R. Owen, Ohio Department of Health

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INSPECTION REPORT 05000440/2007004

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U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No: 50-440

License No: NPF-58

Report No: 05000440/2007004

Licensee: FirstEnergy Nuclear Operating Company (FENOC)

Facility: Perry Nuclear Power Plant, Unit 1

Location: Perry, Ohio

Dates: July 1, 2007, through September 30, 2007

Inspectors: M. Franke, Senior Resident Inspector
M. Wilk, Resident Inspector
R. Clagg, Reactor Engineer
M. Phalen, Health Physicist
J. Robbins, Reactor Engineer

Observers: S. Dettmer, Ohio Department of Health

Approved by: Bruce L. Burgess, Chief
Branch 6
Division of Reactor Projects

Enclosure

SUMMARY OF FINDINGS

IR 05000440/2007004; 07/01/2007 - 09/30/2007; Perry Nuclear Power Plant; Surveillance Testing.

This report covers a three-month period of baseline resident inspection and announced baseline inspection of radiation protection and inservice inspection activities. The inspections were conducted by Region III inspectors and the resident inspectors. 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 4, dated December 2006.

A. NRC-Identified and Self-Revealed Findings

Cornerstone: Mitigating Systems

Green. A finding of very low safety significance and a non-cited violation of Technical Specification 5.4, "Procedures," was self-revealed when the Division 2 emergency diesel generator failed to trip during surveillance testing on August 20, 2007. Specifically, operators failed to position an overspeed trip reset valve in accordance with diesel startup procedures on August 19, 2007, and this disabled the essential overspeed trip function of the diesel. The primary cause of this finding was related to the cross-cutting area of Human Performance per Inspection Manual Chapter 0305 H.4(b) because the licensee failed to communicate and use human error prevention techniques commensurate with the risk of the assigned task. As part of their immediate corrective actions, licensee personnel restored the diesel to the appropriate equipment alignment and conducted additional training for operators on procedure adherence.

The finding was more than minor because it was associated with the Human Performance attribute of the reactor safety Mitigating Systems cornerstone and affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the finding adversely affected an essential trip feature designed to protect the diesel from an overspeed condition. The finding was determined to be of very low safety significance because it was determined not to represent a loss of safety function. (Section 71111.22)

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 and corrective actions are listed in Section 4OA7 of this report.

REPORT DETAILS

Summary of Plant Status

On July 1, 2007, the plant began the inspection period in Mode 4 for a forced outage to replace the 'A' reactor recirculation pump motor. Following outage activities, the plant entered Mode 2 for startup at 4:43 p.m. on July 23. Mode 1 was achieved at 5:08 p.m. on July 24, and the generator was synchronized to the grid at 8:17 p.m. on the same day. After several power maneuvers for testing and control rod alignment, the plant reached 100 percent power at 3:00 p.m. on July 28. On August 23 power was reduced to as low as 92 percent to maintain plant parameters associated with condenser vacuum within limits during a period of warm weather. Power was returned to 100 percent on the following day. On September 7 power was again reduced in response to warm weather to as low as 98 percent and then was returned to 100 percent on the same day. On September 22 power was reduced to 85 percent to insert a control rod that was determined to be inoperable due to a loss of position indication, and then power was returned to 100 percent on the following day. With the exception of planned downpowers for routine surveillance testing and rod sequence exchanges, the plant remained at 100 percent power for the remainder of the inspection period.

1. REACTOR SAFETY

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

1R01 Adverse Weather Protection (711111.01)

a. Inspection Scope

During the week of August 27, 2007, the inspectors observed licensee activities associated with the treatment of raw water systems to control populations of zebra mussels. The inspectors observed pre-job briefings, pre-shift briefings and control room briefings to determine whether the briefings met licensee standards. The inspectors also reviewed prerequisites identified in Plant Technical Instruction (PTI)-GEN-P0024, "Mussel Treatment," Revision 13, to determine whether they were completed prior to the initiation of treatment. 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 5, to determine whether mussel settlement was being properly monitored.

This review represented one inspection sample.

b. 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 emergency service water (ESW) system to review system operability during the month of September. The ESW system was selected due to its risk significance and current system health status. 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 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 and issue review are listed in the attached List of Documents Reviewed.

This review represented one inspection sample.

b. Findings

No findings of significance were identified.

.2 Quarterly Partial System Walkdowns

a. Inspection Scope

The inspectors conducted a partial walkdown of the system trains listed below to determine whether the systems were correctly aligned to perform their designed safety function. The inspectors used VLIs and system drawings during the walkdown. The walkdown 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 walkdown are listed in the attached List of Documents Reviewed. The inspectors reviewed the following systems:

- Division 2 emergency diesel generator (EDG) following a valve alignment error affecting the pneumatic overspeed trip reset valve on August 20, 2007;
- safety-related air system following modification during the week of September 24, 2007; and
- containment vacuum breaker system following maintenance during the week of September 24, 2007.

These reviews represented three quarterly partial system walkdown 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 1AB-1A, 1C and 1G; Auxiliary Building 574' elevation;
- Fire Zone 1AB-2; Auxiliary Building 599' elevation;
- Fire Zone 1AB-3A; Auxiliary Building East 620' elevation;
- Fire Zone 1AB-3B; Auxiliary Building West 620' elevation;
- Fire Zone 0IB-3; Intermediate Building 620' 6" elevation;
- Fire Zone 0IB-5; Intermediate Building 682' elevation; and
- Fire Zones 0EW-1A, 1B; ESW Pumphouse

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 Fire Protection Instruction (FPI)-A-A02, "Periodic Fire Inspections," Revision 5; Perry Administrative Procedure (PAP)-1910, "Fire Protection Program," Revision 15; and PAP-0204, "Housekeeping/Cleanliness Control Program," Revisions 18; 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 in the List of Documents Reviewed at the end of this report were used by the inspectors during the inspection of this area.

These reviews represented seven quarterly inspection samples.

b. Findings

No findings of significance were identified.

1R06 Flood Protection (71111.06)

a. Inspection Scope

During the week of September 17, 2007, the inspectors reviewed the plant underdrain system. The system was designed to provide a method of controlling groundwater level around plant structures. The inspectors reviewed system health reports, CRs, and maintenance orders to assess overall system condition. The inspectors reviewed completed surveillance instructions (SVIs) to assess component and system performance. Finally, the inspectors reviewed the associated alarm response instructions to verify that they could reasonably be used to achieve the desired results.

This review represented one inspection sample.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification (71111.11)

a. Inspection Scope

On August 22, 2007, 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 identified performance deficiencies and specified appropriate remedial actions.

This review represented 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 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 (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 changes to performance criteria were reflected in the licensee's probabilistic risk assessment. During this inspection period, the inspectors reviewed the following systems:

- annulus exhaust gas treatment system;
- reactor recirculation system; and
- main steam isolation valve system.

These reviews represented three quarterly 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 and represented a total of four samples:

- Maintenance risk assessment and scheduling associated with Division 1 EDG emergent control circuit maintenance during the week of August 6, 2007;
- maintenance scheduling impact due to the control complex chiller 'A' extended work window during the week of August 20, 2007;

- maintenance risk assessment and re-scheduling associated with emergent electrical transmission grid conditions during the month of September; and
- risk assessment and management during maintenance on Division 1 emergency core cooling systems on September 28, 2007.

These reviews represented four inspection samples.

b. Findings

No findings of significance were identified.

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 Technical Specification (TS) and Updated Safety Analysis Report (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:

- An operability evaluation associated with the lower containment airlock during the week of July 30, 2007;
- an operability evaluation associated with the Division 2 EDG during the week of August 20, 2007;
- an operability evaluation associated with loose containment grating in the pool swell region during the week of August 27, 2007; and
- an operability evaluation associated with the safety air compressor during the week of September 24, 2007.

These reviews represented four inspection samples.

b. Findings

No findings of significance were identified.

R19 Post-Maintenance Testing (71111.19)

a. Inspection Scope

The inspectors evaluated the following post-maintenance testing activities for risk-significant systems to ensure 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 TS, the USAR, 10 CFR Part 50 requirements, licensee procedures, and various NRC generic communications. In addition, the inspectors reviewed CRs associated with post-maintenance tests 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 activities were reviewed:

- ESW 'C' following pump discharge valve replacement during the week of July 16, 2007;
- containment lower airlock inner door following maintenance on July 26, 2007;
- Division 1 EDG following relay replacement during the week of August 6, 2007; and
- radwaste system containment isolation valve testing following maintenance during the week of September 17, 2007.

These reviews represented four inspection samples.

b. Findings

No findings of significance were identified.

1R20 Refueling and Other Outage Activities (71111.20)

a. Inspection Scope

The inspectors evaluated outage activities that began on June 29, 2007, and ended on July 24, 2007. The plant was shutdown to replace the 'B' recirculation pump motor. The inspectors reviewed activities to ensure that the licensee considered risk in developing, planning, and implementing the outage schedule.

The inspectors observed or reviewed the reactor shutdown, outage equipment configuration and risk management, electrical lineups, selected clearances, control and monitoring of decay heat removal, control of containment activities, startup activities, and identification and resolution of problems associated with the outage.

These outage inspection activities represented a single forced outage inspection sample.

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 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 determined 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 inspectors selected the following surveillance testing activities for review:

- Reactor core isolation cooling (RCIC) system steam line high channel routine functional test on July 11, 2007;
- Division 2 EDG routine test run on August 20, 2007;
- high pressure core spray pump and valve in-service testing performed on September 18, 2007; and
- Division 3 ESW routine testing during the week of September 17, 2007.

These reviews represented four inspection samples.

b. Findings

.1 Loss Of Decay Heat Removal

An unresolved item (URI) was identified that was associated with a loss of cooling water flow to the reactor while was shutdown.

On July 11, 2007, the plant was shutdown in Mode 4 with the 'B' residual heat removal (RHR) loop in service providing decay heat removal for the reactor vessel. A maintenance technician was performing a surveillance test associated with the RCIC steam line flow high instrument channel. At about 11:13 p.m. the technician disconnected a wire for a relay associated with a RCIC system isolation function. This caused the relay to change state. The licensee determined that when the affected relay de-energized, it created an electrical transient that affected the relay's power supply. The affected power supply wires were in close physical proximity to the power wires for an optical isolator associated with a relay for the 'B' RHR pump trip circuit. The licensee determined that the electrical transient resulted in the actuation of the optical isolator and the trip of the 'B' RHR pump.

When the 'B' RHR pump tripped, the reactor vessel bottom head drain temperature instrument indicated about 108 °F (degrees Fahrenheit). Operators monitored vessel temperature using the bottom head drain temperature indication and developed response plans based on an observed

heat up rate of about 1 to 2 °F per hour. Operators took immediate action to restore cooling flow to the reactor vessel using the 'A' RHR loop and established a plan to begin containment closure when reactor vessel indicated temperature reached 140 °F. The inspectors noted that the licensee had calculated a time-to-boil (TTB) value of 2.5 hours, and that this TTB value remained in effect through the entire loss of decay heat removal event. The inspector was concerned with a statement from the shift manager regarding his belief that a significantly longer response time (potentially greater than a day) was available based on observed heat-up rate derived from reactor bottom head temperature indication. During the event, the inspectors questioned licensee personnel in the control room on the discrepancy between the calculated TTB and observed heat-up rate. In response to the inspectors questions, a licensee management representative in the control room remarked that the posted calculated TTB was potentially in need of an update. The inspector was also concerned that the operators may have been misled by the use of bottom head drain temperature as an indication of reactor vessel bulk temperature during this event.

Operators established shutdown cooling flow using the 'A' RHR loop at about 12:42 a.m. on July 12, 2007. When the 'A' RHR pump was started, bottom head temperature indicated about 111 °F and then rose to about 140 °F as water flow was restored to the vessel.

The Regional Senior Reactor Analyst commenced a risk evaluation of the loss of the 'B' RHR loop and subsequent licensee actions. The risk evaluation was ongoing at the end of the inspection period. This issue is considered an URI pending completion of the risk assessment (URI 05000440/2007004-01).

.2 Failure To Follow Procedures Disabled An Emergency Diesel Overspeed Trip

Introduction: A finding of very low safety significance and an NCV of TS 5.4, "Procedures," was self-revealed the Division 2 EDG failed to trip during surveillance testing on August 20, 2007. Specifically, operators failed to position a diesel over-speed reset valve in accordance with diesel startup procedures on August 19, 2007.

Description: At about 4:46 p.m., on August 20, 2007, following a 24-hour test run of the Division 2 EDG, operators were performing a post-shutdown inspection of the Division 2 EDG using System Operating Instruction (SOI)-R43, "Division 1 and 2 Diesel Generator System," Revision 31. This procedure required operators to perform an overspeed trip of the diesel. When operators placed the overspeed vent valve in trip, the diesel did not trip. Operators subsequently found that the overspeed reset valve was in the "reset" position and identified that the valve should have been in the "normal" position.

The licensee conducted an investigation and determined that the valve was placed in the incorrect position on August 19 when two operators were performing a pre-start-up inspection for the EDG using SOI-R43 Section 7.19. Section 7.19, step 23 of the procedure, directed operators to reset the overspeed trip function by positioning the diesel overspeed vent valve lever to "reset" and

then back to “normal” following air venting. At the end of Section 7.19, step 31 directed operators to perform an independent verification of required components. The start time of the August 19 pre-start inspection was recorded in the control room logs as 12:20 p.m. and the completion time was recorded as 1:14 p.m.

The licensee determined that two operators performed the August 19 inspection procedure associated with the reset of the overspeed trip. One operator was assigned to read the procedure steps and the other operator was assigned to manipulate the valve, which required climbing on the EDG to reach, and was in an area with limited space. The operator that performed the valve manipulation to place the valve in “normal” recalled during interviews that he thought he had placed the valve in the correct position. The other operator, who performed the independent verification, recalled he had thought the valve was in the correct position. The inspectors noted that both operators had marked the procedure as completed satisfactorily.

The licensee determined that the valve position error was caused by a failure to follow the procedure and that the step to place the valve in the correct position was either not communicated correctly or was missed. The inspectors noted that the procedure instructions to place the valve back in “normal” were not included in a stand-alone step, but were at the end of a procedure step instructing operators to wait for air to stop venting.

The licensee concluded that inadequate independent verification performance contributed to the error and determined that the use of independent verification was not discussed as part of the pre-job brief.

As part of their immediate corrective actions, licensee personnel corrected the EDG valve alignment and satisfactorily tested the EDG overspeed trip function. The licensee conducted additional training of operations staff on the event and the use of human performance tools.

Analysis: The inspectors determined that the failure of the licensee operations personnel to adhere to operating procedures affecting the safety-related Division 2 EDG system was a performance deficiency warranting a significance evaluation. The inspectors concluded that the finding was greater than minor in accordance with Appendix B, “Issue Screening,” of IMC 0612, “Power Reactor Inspection Reports,” dated November 2, 2006. The finding was more than minor because it was associated with the Human Performance attribute of the reactor safety Mitigating Systems cornerstone and affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the finding resulted in an incorrect EDG alignment and disabled an essential trip feature designed to protect the diesel from an overspeed condition. The inspectors determined that the finding was of very low safety significance because it did not result in a loss of safety function and was not risk significant due to a seismic, flooding, or severe weather initiating event.

The primary cause of this finding was related to the cross-cutting area of Human Performance per IMC 0305 H.4(b) because the licensee failed to communicate and use human error prevention techniques commensurate with the risk of the assigned task. Specifically, the use of independent verification was not discussed as part of the pre-job brief and the implementation of the verification in the field was not adequate to ensure that the valve was correctly aligned.

Enforcement: Technical Specification 5.4, "Procedures," required the implementation of the applicable procedures recommended in Regulatory Guide 1.33, "Quality Assurance Program Requirements (Operation)," Revision 2, dated February 1978. Regulatory Guide 1.33, Appendix A, required the implementation of written procedures for the operation of the EDGs. Contrary to this requirement, on August 19, 2007, licensee personnel failed to adhere to procedures during operation of the Division 2 EDG and inadvertently disabled an essential trip feature designed to protect the diesel from an overspeed condition. However, because of the very low safety significance of the issue and because the issue was entered into the licensee's corrective action program (CR 07-25401), the issue is being treated as an NCV consistent with Section VI.A.1 of the NRC Enforcement Policy (NCV 05000440/2007004-02).

1R23 Temporary Plant Modifications (71111.23)

a. Inspection Scope

The inspectors reviewed the following temporary modifications. The inspectors assessed the acceptability of the temporary configuration changes by comparing the 10 CFR 50.59 screening and evaluation information against the design basis, the Updated Final Safety Analysis Report (UFSAR), and the TS as applicable. The comparisons were performed to ensure that the new configurations remained consistent with design basis information. The inspectors, as applicable, performed field verifications to ensure that the modifications were installed as directed; the modifications operated as expected; modification testing adequately demonstrated continued system operability, availability, and reliability; and that operation of the modifications did not impact the operability of any interfacing systems.

- reactor control rod drive system relief valve blank flange installation during the weeks of August 13 and August 20, 2007; and
- reactor rod control and information system modification performed on September 15, 2007

These reviews represented two inspection samples.

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY

Cornerstone: Public Radiation Safety

2PS2 Radioactive Material Processing and Transportation (71122.02)

.1 Radioactive Waste System Description and Waste Generation

a. Inspection Scope

The inspectors reviewed the liquid and solid radwaste system descriptions in the Final Safety Analysis Report (FSAR) and reviewed the 2005 and 2006 Annual Environmental and Effluent Release Reports for information on the types and amounts of radioactive waste generated and disposed. The inspectors reviewed the scope of the licensee's audit/self-assessment activities with regard to the radioactive material processing and transportation programs to determine if those activities satisfied the requirements of 10 CFR 20.1101(c) and the quality assurance audit requirements of 10 CFR Part 20, and of 10 CFR 71.137, as applicable.

These reviews represented one inspection sample.

b. Findings

No findings of significance were identified.

.2 Radioactive Waste System Walkdowns

a. Inspection Scope

The inspectors walked down selected portions of the liquid and solid radwaste processing systems to verify that these systems were consistent with the descriptions in the FSAR and in the Process Control Program and to assess the material condition and operability of those systems. No significant changes were made to the radwaste processing systems since the last inspection of this program area. The inspectors reviewed the status of radwaste process equipment that had not been operated for several years. Portions of the equipment remained in place, although not fully isolated. The inspectors discussed with the licensee the physical and administrative controls preventing the inadvertent use of this equipment and the potential impact of any inadvertent use of this equipment, such as an unmonitored release or a source of unnecessary personnel exposure.

The inspectors reviewed the licensee's processes for transferring waste into shipping containers to determine if appropriate waste stream mixing and sampling was performed so as to obtain representative waste stream samples for analysis. The inspectors reviewed the licensee's practices for the collection of area smear surveys to represent the dry-active waste (DAW) stream and the methods used for determining the radionuclide mix of various filter media to determine if they were representative of the intended radwaste stream. Additionally, the inspectors reviewed the methodologies for

quantifying gamma emitting radionuclide waste stream content, for determining waste stream tritium concentrations and for waste concentration averaging to ensure that representative samples of the waste products were provided for the purposes of waste classification pursuant to 10 CFR 61.55.

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 methods and procedures for determining the classification of radwaste shipments including the use of scaling factors to quantify difficult-to-measure radionuclides (e.g., pure alpha or beta emitting radionuclides and those that decay by electron capture). The inspectors reviewed the last two radiochemical sample analysis results (i.e., 10 CFR Part 61 analyses) including vendor laboratory data for each of the licensee's waste streams and the associated calculations used to account for difficult-to-measure radionuclides. These waste streams consisted of various resins, concentrator waste sludge, filter media, DAW and irradiated hardware (activated metals). The inspectors also reviewed the minimum detectable concentrations achieved for each waste stream as determined by the licensee's contract analytical laboratory, compared to the corresponding radionuclide groupings in 10 CFR 61.55, to determine whether the concentration values satisfied the NRC Branch Technical Position on Radioactive Waste Classification. These reviews were conducted to determine if the licensee's program assured compliance with 10 CFR Part 61. The inspectors also reviewed the licensee's waste characterization and classification program to determine if reactor coolant chemistry data was periodically evaluated to account for changing operational parameters that could potentially affect waste stream classification and thus validate the continued use of existing scaling factors between sample analysis updates.

These reviews represented one inspection sample.

b. Findings

No findings of significance were identified.

.4 Shipment Preparation and Shipment Manifests

a. Inspection Scope

The inspectors reviewed selected documentation of shipment packaging, surveying, package labeling and marking, vehicle inspections and placarding, emergency instructions, and licensee verification of shipment readiness for non-excepted radioactive material and radwaste shipments. Specifically:

- Shipping Record 053045; General Electric Tools / Equipment;
- Shipping Record 061006; Condensate Backwash Settling Tank Resin;
- Shipping Record 061019; Reactor Water Clean Up Backwash Settling Tank Resin;
- Shipping Record 061023; Reactor Water Clean Up Backwash Settling Tank Resin; and
- Shipping Record 063042; Explosive Detector w/ Radioactive Source.

For each shipment, the inspectors determined if the requirements of 10 CFR Parts 20 and 61, and those of the Department of Transportation (DOT) in 49 CFR Parts 170-189 were met. Specifically, records were reviewed and staff involved in shipment activities were interviewed to determine if packages were labeled and marked properly, if package and transport vehicle surveys were performed with appropriate instrumentation, whether survey results satisfied DOT requirements, and if the quantity and type of radionuclides in each shipment were determined accurately. The inspectors also determined whether shipment manifests were completed in accordance with DOT and NRC requirements and if they included the required emergency response information.

Selected staff involved in shipment activities were interviewed by the inspectors to determine if they had adequate skills to accomplish shipment related tasks and to determine if the shippers were knowledgeable of the applicable regulations to satisfy package preparation requirements for public transport with respect to NRC Bulletin 79-19, "Packaging of Low-Level Radioactive Waste for Transport and Burial," and 49 CFR Part 172 Subpart H. Also, the inspectors observed a radiation protection (RP) technician conduct surveys of a control rod drive suction filter change out to assess the adequacy of the surveys used to classify the waste for shipment. Additionally, the lesson plans for safety training and for general awareness/familiarization training for RP technicians, station laborers, and for warehouse staff were reviewed for compliance with the hazardous material training requirements of 49 CFR 172.704.

These reviews represented two inspection samples.

b. Findings

No findings of significance were identified.

.5 Identification and Resolution of Problems for Radwaste Processing and Transportation

a. Inspection Scope

The inspectors reviewed Licensee Event Reports (LERs) (as applicable), self-assessment and audit reports, along with field observation reports that involved the radwaste and radioactive materials shipping program since the last inspection to determine if the licensee had effectively implemented its corrective action program and that problems were identified, characterized, prioritized, and corrected. The inspectors determined whether the licensee's oversight mechanisms (audits, self-assessments, etc.) collectively were capable of identifying repetitive deficiencies or significant individual deficiencies in problem identification and resolution.

The inspectors also selectively reviewed CRs generated since the previous inspection that dealt with the radioactive material/radwaste shipping program or waste processing activities 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 program; and
- implementation/consideration of risk-significant operational experience feedback.

These reviews represented one inspection sample.

b. Findings

No findings of significance were identified.

Cornerstone: Occupational Radiation Safety

2OS3 Radiation Monitoring Instrumentation and Protective Equipment (71121.03)

.1 Inspection Planning

a. Inspection Scope

The inspectors reviewed the Perry Nuclear Power Plant Unit 1 UFSAR to identify applicable radiation monitors associated with measuring transient high and very high radiation areas including those used in remote emergency assessment. The inspectors identified the types of portable radiation detection instrumentation used for job coverage of high radiation area work, including instruments used for underwater surveys, fixed area radiation monitors used to provide radiological information in various plant areas, and continuous air monitors used to assess airborne radiological conditions and work areas with the potential for workers to receive a 50 millirem or greater committed effective dose equivalent. Contamination monitors, whole body counters and those radiation detection instruments utilized for the release of personnel, and equipment from the radiologically controlled area were also identified.

These reviews represented two inspection samples.

b. Findings

No findings of significance were identified.

.2 Walkdowns of Radiation Monitoring Instrumentation

a. Inspection Scope

The inspectors conducted walkdowns of selected area radiation monitors (ARMs) in the main control room, turbine, radwaste, and reactor buildings to verify they were located as described in the UFSAR and were optimally positioned relative to the potential source(s) of radiation they were intended to monitor, and to verify that control room instrument readout and high alarm setpoints for those ARMs were consistent with UFSAR information and actual field conditions. Walkdowns were also conducted of those areas where portable survey instruments were calibrated/repaired and maintained for RP staff use to determine if those instruments designated "ready for use" were sufficient in number to support the RP program, had current calibration stickers, were operable, and were in good physical condition. Additionally, the inspectors observed the licensee's instrument calibration units and the radiation sources used for instrument checks to assess their material condition and discussed their use with RP staff to determine if they were used adequately. Licensee personnel were also observed performing source checks of selected instruments.

These reviews represented one inspection sample.

b. Findings

No findings of significance were identified.

.3 Calibration and Testing of Radiation Monitoring Instrumentation

a. Inspection Scope

The inspectors selectively reviewed radiological instrumentation associated with monitoring transient high and/or very high radiation areas, instruments used for remote emergency assessment, and radiation monitors used to identify personnel contamination and for assessment of internal exposures to verify that the instruments had been calibrated as required by the licensee's procedures, consistent with industry and regulatory standards. The inspectors also reviewed alarm setpoints for selected ARMs to verify that they were established consistent with the UFSAR and TS, as applicable. Specifically, the inspectors reviewed calibration procedures and the most recent calibration records and/or source characterization/output verification documents for the following radiation monitoring instrumentation and instrument calibration equipment:

- containment high range area radiation monitors;
- drywell high range area radiation monitors;
- main control room;
- traversing in-core probe room ARM;
- refuel floor ARMs;
- small article monitors used at plant egress points;
- J. L. Shepherd instrument calibrator;
- portable survey instruments used for underwater surveys;

- whole body counter;
- portal monitors used at the Primary Access Portal; and
- personnel contamination monitors used at the egress points.

The inspectors determined what actions were taken when, and during calibration or source checks, an instrument was found significantly out of calibration or exceeded as-found acceptance criteria. 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 prior calibration. The inspectors also reviewed the licensee's 10 CFR Part 61 source term information to determine if the calibration sources used were representative of the plant source term and that difficult to detect nuclides were scaled into whole body count dose determinations.

These reviews represented one inspection sample.

b. Findings

No findings of significance were identified.

.4 Problem Identification and Resolution

a. Inspection Scope

The inspectors reviewed licensee CRs and any 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. Licensee audits and CRs were also reviewed to verify that deficiencies and problems with radiological instrumentation, the radiation monitoring system or self-contained breathing apparatus (SCBA) were identified, characterized, prioritized, and resolved effectively using the corrective action program.

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, as applicable. Members of the RP staff were interviewed and corrective action documents were reviewed to verify that 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; and
- identification and implementation of effective corrective actions.

The inspectors determined if the licensee's self-assessment and/or audit activities were identifying and addressing repetitive deficiencies or significant individual deficiencies in problem identification and resolution.

These reviews represented three inspection samples.

b. Findings

No findings of significance were identified.

.5 Radiation Protection Technician Instrument Use

a. Inspection Scope

The inspectors selectively verified that calibrations for those instruments recently used and for those designated for use had not lapsed. The inspectors reviewed instrument logs to verify that response checks of portable survey instruments were completed prior to instrument use and upon return of the instrument to the storage area after use, as required by the licensee's procedure. The inspectors also discussed instrument calibration methods and source response check practices with RP staff and observed staff complete instrument operability checks prior to use.

These reviews represented one inspection sample.

b. Findings

No findings of significance were identified.

.6 Self-Contained Breathing Apparatus (SCBA) Maintenance/Inspection and User Training

a. Inspection Scope

The inspectors reviewed aspects of the licensee's respiratory protection program for compliance with the requirements of Subpart H of 10 CFR Part 20 and to determine if SCBA was properly maintained and ready for emergency use. The inspectors reviewed the status, maintenance, and surveillance records of SCBAs staged and ready for emergency use in various areas of the plant and assessed 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 selected control room staff designated for the active on-shift duty roster, including those individuals on the station's fire brigade, were trained, respirator fit tested, and medically certified to use SCBAs. Additionally, the inspectors reviewed SCBA qualifications for the emergency response organization's radiological emergency team to determine if a sufficient number of staff were qualified to fulfill emergency response positions to meet the requirements of 10 CFR 50.47. The inspectors also reviewed respiratory protection training lesson plans to assess their overall adequacy for compliance with Subpart H, and to verify that personal SCBA air bottle replacement was adequately covered.

The inspectors walked down the bottled air supply rack and spare air bottle stations and inspected SCBA equipment maintained in the main control room complex and SCBA equipment staged for emergency use in various areas of the plant. During the walkdowns, the inspectors examined several SCBA units to assess their material condition, to verify that air bottle hydrostatic tests were current, and to verify that bottles

were pressurized to meet procedural requirements. The inspectors reviewed records of SCBA equipment inspection and functional testing and observed selected operations personnel inspect, don, doff, and use SCBA air packs to determine if these activities were performed consistent with procedure and the equipment manufacturers recommendations. The inspectors also ensured that the required, periodic air cylinder hydrostatic testing was documented and up to date, and that the DOT-required retest air cylinder markings were in place for several randomly selected SCBA units. Additionally, the inspectors reviewed vendor training certificates for those individuals involved in the repair of SCBA pressure regulators to determine if those personnel that performed maintenance on components vital to equipment function were qualified. The most recent component test records were reviewed by the inspectors for selected SCBA equipment currently designated for emergency use.

These reviews represented two inspection samples.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

Cornerstone: Barrier Integrity

4OA1 Performance Indicator Verification (71151)

.1 Reactor Coolant System Specific Activity

a. Inspection Scope

The Inspectors sampled the licensee's PI submittals for the periods listed below. The inspectors used PI definitions and guidance contained in the applicable sections of Revisions 4 and 5 of Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," to verify the accuracy of the PI data. Specifically, the inspectors reviewed chemistry department records, including isotopic analyses for selected dates in 2006 through June 2007, to determine if the greatest dose equivalent iodine (DEI) values determined for Unit 1 during steady-state operations corresponded to the values reported to the NRC. The inspectors also reviewed selected DEI calculations including the application of dose conversion factors as specified in plant TS. Additionally, the inspectors accompanied a chemistry technician and observed the collection, preparation and analysis of reactor coolant system samples to evaluate compliance with the licensee's sampling procedures. Further, sample analyses and calculation methods were discussed with chemistry staff to determine their adequacy relative to TS, licensee procedures and industry guidelines.

This review represented one inspection sample.

b. Findings

No findings of significance were identified.

.2 Other Performance Indicators

a. Inspection Scope

The inspectors reviewed reported 2nd quarter 2007 data for unplanned scrams, scrams with loss of normal heat removal, unplanned power changes, emergency AC power, and reactor coolant system leakage performance indicators using the definitions and guidance contained in Nuclear Energy Institute (NEI) 99-02, "Regulatory Assessment Indicator Guideline," Revision 3. The inspectors reviewed station logs, event notification reports, and LERs to verify the accuracy of the licensee's data submission.

These reviews represented four inspection samples.

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 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 is not an inspection sample.

b. Findings

No findings of significance were identified.

.2 Semi-Annual Trend Review

a. Inspection Scope

The inspectors reviewed monthly performance reports, self-assessments, quality assurance assessment reports, performance improvement initiatives and CRs to identify any trends that had not been adequately evaluated or addressed by proposed corrective actions.

This review represented one semi-annual trend review inspection sample.

b. Findings

No findings of significance were identified.

.3 Annual Sample Review - Operator Workarounds

a. Inspection Scope

During the week of July 30, 2007, the inspectors performed a semiannual review of the cumulative effects of operator workarounds (OWAs). The list of open OWAs was reviewed to identify any potential effect on the functionality of mitigating systems. Inspection activities included, but were not limited to, a review of the cumulative effects of the OWAs on the availability and the potential for improper operation of the system, for potential impacts on multiple systems, and on the ability of operators to respond to plant transients or accidents. Additionally, the inspectors conducted a review of recent CRs to ensure that OWA-related issues were entered into the corrective action program when required.

This review represented one inspection sample.

b. Findings and Observations

No findings of significance were identified.

.4 Annual Sample Review - RHR Pump Trip Root Cause

a. Inspection Scope

On June 11, 2007, the 'B' RHR pump tripped unexpectedly leading to a loss of shutdown cooling flow to the reactor. Operators placed the 'A' RHR loop in service and restored cooling water flow to the reactor. The licensee completed a root cause evaluation of this event and the inspectors selected it for review due to its safety significance. The report was reviewed to ensure that the full extent of the issue was identified, an appropriate evaluation was performed, and appropriate corrective actions were specified and prioritized. The inspectors evaluated the report against the requirements of the licensee's corrective action program.

This review represented one inspection sample.

b. Findings and Observations

An URI related to this issue is documented in Section 1R22 of this report.

4OA3 Event Followup (71153)

.1 Loss of Decay Heat Removal

a. Inspection Scope

The inspectors reviewed the circumstances involving the July 11, 2007, loss of decay heat removal event. The inspectors responded to the control room and observed operator actions in response to a trip of the 'B' RHR pump that was providing cooling water flow to the reactor while the reactor was shutdown. The inspectors reviewed the licensee's actions associated with the event to determine whether the actions were in accordance with TS, procedures, and reporting requirements.

b. Findings

No findings of significance were identified.

.2 (Closed) LER 2007-001-00: "Automatic Reactor Protection System Actuation Due To Reactor Coolant Level Decrease."

a. Inspection Scope

On May 15, 2007, at about 12:58 a.m., the reactor protection system (RPS) automatically actuated in response to decreasing reactor pressure vessel (RPV) coolant level. The plant was in Mode 1 operating at 31 percent of rated thermal power at the time of the automatic scram. In response to the scram, all control rods fully inserted into the core and operators maintained RPV coolant level such that no automatic emergency core cooling system (ECCS) response occurred. The cause of the event was attributed to decreasing RPV coolant level resulting from a design logic error not detected during modification pre-operational engineering review and testing activities. At the time of the event, reactor feedwater system test/tuning activities were in progress. During the Perry Nuclear Power Plant 11th refueling outage in April 2007, the electronic governor system for the reactor feed pump turbine (RFPT) control system was replaced with a new digital RFPT speed control system. During testing activities on May 15, 2007, the 'A' RFPT was providing feedwater to the RPV and 'B' RFPT was at idle speed not providing feedwater. When 'A' RFPT was placed in manual control, actual RPV level was greater than programmed RPV level. A logic design error allowed a demand signal to be produced that would reduce feedwater flow to the RPV. When actual RPV level did not change, a feedback circuit created a larger demand signal to reduce flow to zero. When the 'A' RFPT was returned to automatic control, the 'A' RFPT stopped providing feedwater flow to the RPV. Although manual action was taken to recover the RPV coolant level, the decreasing level could not be recovered before RPV coolant level reached the RPV Level 3 RPS setpoint (178 inches above top of active fuel). After the RPS actuated a Scram, the turbine-generator tripped, the Reactor Mode switch was placed in "Shutdown," and the motor-driven feedwater pump was started and operators restored RPV level. The plant entered Mode 4 on May 15, 2007. No new findings were identified in the inspectors' review. A finding associated with this LER was documented in Inspection Report 05000440/2007003. This LER is closed.

b. Findings

No findings of significance were identified.

.3 Storm Drain Spill

a. Inspection Scope

The inspectors reviewed the circumstances associated with a September 19, 2007, chemical discharge to the environment. Licensee personnel identified a white substance at a storm drain discharge to a stream that passed through the owner controlled area. Samples were taken from the stream and were found to be at a pH level of 11.2 standard units. The licensee reported the discharge to the Ohio Environmental Protection Agency and determined that the white substance was calcium carbonate. On September 20, 2007, the licensee reported this incident to the NRC in accordance with 10CFR50.72(b)(2)(xi). The inspectors reviewed the licensee's actions associated with the event to determine whether the actions were in accordance with TS, procedures, and reporting requirements.

b. Findings

No findings of significance were identified.

.4 Increased Drywell Unidentified Sump Leakage

a. Inspection Scope

On September 26, 2007, the inspectors determined that the increase of unidentified sump leakage from 0.1 gallon per minute (gpm) to 0.3 gpm constituted a Level 3 Action requirement in accordance with IMC 2515 Appendix D. The inspectors reviewed the circumstances of this event and the licensee's actions in response to the increased unidentified leakage rate to determine whether the licensee's actions were consistent with TS and licensee procedures.

b. Findings

No findings of significance were identified.

.5 Off-Site Contaminated Worker Notification

a. Inspection Scope

The inspectors reviewed the circumstances involving the April 5, 2007, off-site transportation of a potentially contaminated worker to Lake East Hospital (Event Notification No. 43282). The inspectors reviewed the incident to ensure that the licensee adequately reported the incident in accordance with the requirement contained in 10 CFR 50.72; that the licensee performed adequate radiological surveys of the

individual, the ambulance, and any effected areas of the hospital; and that the licensee implemented adequate measures to ensure that radioactive material was not released into the public domain.

b. Findings

No findings of significance were identified.

4OA6 Meetings

.1 Exit Meeting

The inspectors presented the inspection results to Mr. B. Allen and other members of licensee management on October 10, 2007. The licensee acknowledged the findings presented. 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

- An interim exit meeting was conducted for radioactive material processing and transportation with Mr. B. Allen and Mr. K. Krueger on July 20, 2007; and
- An interim exit meeting was conducted for the occupational radiation safety program for radiation monitoring instrumentation and protective equipment with Mr. B. Allen on August 24, 2007.

4OA7 Licensee-Identified Violation

The following violations of very low safety significance (Green) were identified by the licensee, have been reviewed by the inspectors, and were a violation of NRC requirements which meets the criteria of Section VI of the NRC Enforcement Policy, NUREG-1600, for being dispositioned as an NCV.

Cornerstone: Public Radiation Safety

In 2005 the licensee shipped four safety-relief valves off-site. During that shipment, a valve tie down strap failed and one of the valves fell over, shifting the contents of the package (i.e., a sea-van container) as described in CR 05-01642. Although the package integrity was challenged, no breach of the package occurred during the shipment. The licensee's investigation determined that the safety-relief valve was insufficiently restrained for transport and that the licensee's pre-transport inspection of the shipping package was inadequate. Title 10 CFR 71.5 requires, in part, that each licensee who transports licensed material on public highways, shall comply with the applicable requirements of the DOT regulations in 49 CFR Parts 171 through 180. Title 49 CFR 173.24(b)(2) states, in part, that each package used for the shipment of hazardous materials shall be filled and its contents so limited, so that under conditions normally incident to transportation, the effectiveness of the package will not be substantially reduced.

Contrary to the above, the shipping container was not filled in such a manner that the effectiveness of the package would not be substantially reduced. The contents of the package (i.e., the safety valve) shifted while the package was in transport, with the falling safety-relief valve having a deleterious effect on the shipping container. The cause of the event has been determined to be inadequately verifying transport package integrity of the safety-relief valve. Specifically, the safety-relief valve restraint was verified remotely by picture, as opposed to the licensee physically verifying the adequacy of the shipping container's internal contents restraints. Corrective actions included instituting procedural requirements to physically verify the internal and external adequacy of shipping packages and containers. The performance deficiency represents a finding of very low safety significance because no transportation radiation limit was exceeded, no breach of the package occurred during transport, the issue did not involve a certificate of compliance, or a low level burial ground non-conformance, nor was there a failure to make notifications or provide emergency information.

Cornerstone: Occupational Radiation Safety

On two occasions, the licensee failed to maintain the appropriate configuration control over in-use respiratory equipment as required, to maintain the National Institute for Occupational Safety and Health (NIOSH) equipment certifications.

Title 10 CFR Part 20.1703 "Use of Individual Respiratory Protection Equipment" requires, in part, that the licensee shall use only respiratory protection equipment that is tested and certified by the NIOSH. Title 42 (Public Health) CFR Part 84 "Approval of Respiratory Protective Devices" states in part that, labels contain a list of cautionary statements, including advise to users to never substitute, modify, add, or omit parts and to use only exact replacement parts as specified by the manufacture. Contrary to the above, on two occasions, the licensee failed to maintain in-use respiratory protection equipment in accordance with its NIOSH approved configuration. Both of these issues were documented in the licensee's corrective action program (CR 04-06757, 05-06434 and CR 05-07449). Corrective actions included training and qualifying station personnel on the use and maintenance of respiratory equipment and instituting in-house diagnostics on the equipment in order to provide more explicit instructions to the vendor when sending the equipment out for servicing. This finding is of very low safety significance because it did not involve As-Low-As-Is-Reasonably-Achievable planning or work controls, there was no overexposure or potential for an overexposure, and the licensee's ability to access dose was not compromised.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

B. Allen, Site Vice President
K. Krueger, Plant General Manager
D. Evans, Operations Manager
E. Gordon, Radiation Protection Technical Superintendent
J. Lausberg, Regulatory Compliance Manager
S. Lee, Acting, Radiation Protection Manager
J. Shaw, Nuclear Engineering Director
S. Thomas, Radiation Protection Manager
M. Wayland, Maintenance Director

Nuclear Regulatory Commission

B. Burgess, Chief, Reactor Projects Branch 6

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

05000440/2007004-02 NCV Failure To Follow Procedures Disabled Emergency Diesel
Overspeed Trip (Section 1R22.2)

Closed

05000440/2007-001-00 LER Automatic Reactor Protection System Actuation Due To
Reactor Coolant Level Decrease (Section 4OA3.2)

Opened

050004402007004-01 URI Loss of Decay Heat Removal Resulting From Failure To
Follow Procedures (Section 1R22.1)

Discussed

None.

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 of 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.

Section 1R01 Adverse Weather Protection

PTI-GEN-P0024, "Mussel Treatment," Revision 13

PTI-GEN-P0023, "Mussel Monitoring" Revision 5

Zebra Mussel Treatment Awareness Training PowerPoint; issued August 2007

CR 07-25819; Zebra Mussel Treatment Halted Due To Inability To Achieve Target Injection; dated August 28, 2007

CR 07-25838; Lube Oil Cooler Repeat Maint [sic]; dated August 29, 2007

Section 1R04 Equipment Alignment

Perry Nuclear Power Plant, Plant Health Report, 2006-2

VLI-P45, Emergency Service Water System, Rev. 7

Trending Data for "Component Mispositioning Performance," January 2006 to August 2007

CR Reports filtered for Configuration Control, January 2006 to August 2007

CR Reports filtered for Misposition, January 2006 to August 2007

CR Reports filtered for ESW, January 2006 to August 2007

CR 07-27074; Stripped Bolt Hole On The Safety Related Instrument Air Compressor; dated September 25, 2007

CR 00-1765; Inadvertent Opening of Vacuum Breaker in Containment; dated June 2000

CR 01-0977; Inadvertent Opening of Vacuum Breaker in Containment; dated June 2000

CR 05-03221; CNMT Vacuum Breaker Failed its Lift Check during SVI-M17-T0408; dated April 2005

Drawing B-208-111, Containment Vacuum Relief System, Sheets 0-8, Rev. B

Section 1R05 Fire Protection

FPI-1AB; Auxiliary Building Unit 1; Revision 2

FPI-0IB; Intermediate Building; Revision 5

FPI-0EW; Emergency Service Water Pumphouse; Revision 4

Section 1R06 Flood Protection

Drawing B 258-0190-00001; Plant Underdrain System Underdrains Pump P72C001A; Revision H

Drawing D 302-0861-00000; Plant Foundation Underdrains System; Revision S

Drawing B 208-0190-00200; Plant Underdrains System Manhole Discharge Flow

CR 07-13949; Unexpected Manhole 11 High Water Level Alarms; dated February 4, 2007

CR 07-12372; Inadequate Response To CR 06-10809 On Underdrain Alarms; dated January 8, 2007

Section 1R11 Licensed Operator Requalification

OTLC-30582007_PY-SGD; Training Scenario; dated June 28, 2007

Section 1R12 Maintenance Effectiveness

Maintenance Rule Functions Currently Classified as (a)1; dated July 2007

CR 07-18167; Leakage Rate of 1B21F0028C Exceeds Acceptance Criteria in SVI-B21-T9000; dated April 11, 2007

Corrective Action for CR 07-18167; Leakage Rate of 1B21F0028C Exceeds Acceptance Criteria in SVI-B21-T9000; dated May 1, 2007

Cause Analysis for CR 07-18197; Leakage Rate of 1B21F0028C Exceeds Acceptance Criteria in SVI-B21-T9000; dated May 1, 2007

Maintenance Rule Failure Review Sheet for CR 07-18197; Leakage Rate of 1B21F0028C Exceeds Acceptance Criteria in SVI-B21-T9000; dated June 29, 2007.

CR 07-19355; MSIV Outboard Leakage Exceeds T.S. Limit; dated April 26, 2007

SVI-B21-T9000; Type C Local Leak Rate Test of B21 MSL Penetrations (P122, P124, P415 and P416); Revision 05

NOP-ER-1001; Continuous Equipment Performance Improvement; Revision 01
PAP-1125; Monitoring the Effectiveness of Maintenance Program Plan; Revision 8
NUREG-0800, Chapter 17, dated March 2007

CR 07-25828; Damper 1M15F0080B Failed to Reposition on 8/26/2007 When B Train Shutdown; dated August 28, 2007

CR 07-25774; 1M15F0080B Hydramotor Failed in the Closed Position; dated August 27, 2007

CR 07-25179; SVI-M15T1240A Low Flow; dated August 14, 2007

CR 07-14749; AEGTS "A" Controller Oscillations Result in PEI-N11 Entry; dated February 18, 2007

CR 07-14439; AEGTS Fan A Total Runtime > 520 hours; dated February 12, 2007

CR 07-13529; Unplanned LCO Entry Shifting AEGTS Fans; dated January 28, 2007

CR 07-13527; Low As-found Flow Condition Noted During PTI Performance; dated January 27, 2007

CR 06-10805; Unexpected AEGT B Start; dated December 1, 2006

CR 06-10588; Annulus Exhaust Gas Treatment System High Flow Discovered During PMT; dated November 22, 2006

CR 06-10465; Annulus Exhaust Gas Treat Unresolved Long Standing Equipment Reliability Issues; dated November 22, 2006

CR 06-10106; AEGTS Fan B Auto Started During Shift After Being Secured; dated November 16, 2006

CR 06-9466; Original Deficiency AEGTS Fan A; dated November 3, 2006

CR 06-8209; Potential for Repeat Maintenance - Low Flow Alarm - M15; dated October 17, 2007

CR 06-6826; Annulus Exhaust Gas Treatment System Flow Indication/Alarm OOS; dated September 26, 2006

CR 06-6379; 1M15C0001A Low Flow Alarm Being Received, With Fan Normal Operation; dated September 15, 2006

CR 06-6226; Unable to Complete Shift of AEGTS Fan Due to Low Flow; dated September 12, 2006

CR 06-03880; Unexpected Low Flow Alarm on 1M15C0001A During Normal Operations; dated August 28, 2006

CR 06-01629; Unexpected Annulus Differential Low Alarm Causes Entry Into PEI-N11; dated April 10, 2006

CR 07-25371; Valve Leaks by Seat - Leaking into Suppression Pool; dated August 20, 2007

CR 07-23056; Unacceptable Reactor Recirculation Material Condition; dated July 5, 2007

CR 07-14315; Leakage Identified on Reactor Recirculation HPU 'B' Skid; dated February 13, 2007
CR 07-14080; Indication of an Increase in Vibration Amplitudes on the Motor; dated March 8, 2007
CR 06-9220; Recirc Pump LFMG Sets Foundation Cracks; dated November 1, 2006

Section 1R13 Maintenance Risk Assessments and Emergent Work Control

PYBP-DES-0001; On-Line Risk Assessment Reference Guide; Revision 4
PAP-1924; Risk-Informed Safety Assessment and Risk Management; Revision 4
PDB-C0011; PSA Pre-Solved Configurations for On-line Risk; Revision 3
Perry Work Implementation Schedule; Week 05, Period 2
Perry Work Implementation Schedule; Week 03, Period 2
Perry Work Implementation Schedule; Week 02, Period 2
Perry Work Implementation Schedule; Week 11, Period 1
Perry Work Implementation Schedule; Week 10, Period 1
PSA Risk Assessment; Week 05, Period 2; Revision 1
PSA Risk Assessment; Week 03, Period 2; Revision 1
PSA Risk Assessment; Week 02, Period 2; Revision 1
PSA Risk Assessment; Week 11, Period 1; Revision 0
PSA Risk Assessment; Week 10, Period 1; Revision 0

Section 1R15 Operability Evaluations

NOP-OP-1009; Immediate and Prompt Operability Determination; Revision 00
PAP-0205; Operability of Plant Systems; Revision 17
NOP-OP-1007; Risk Determination; Revision 4
CR 07-25695; Containment Grating Hold Down Blocks Missing; dated August 26, 2007
CR 07-25401; Division 2 D/G Valve Found Out Of Position; dated August 20, 2007
CR 07-27074; Stripped Bolt Hole on the Safety Related Instrument Air Compressor; dated September 25, 2007
SOI-P57; Safety Air System, Section 7.3
UFSAR Section 6.8, Revision 12

Section 1R19 Post-Maintenance Testing

WO 200270536; HPCS ESW Discharge Valve; dated July 06, 2007
PAP-1115; Snubber Augmented Visual Inservice Inspection/Examination and Functional Testing Program; Revision 13
Clearance PYF-P53-0002A; Lower Containment Airlock Barrel; July 12, 2007
WO 2000176059; Lower Containment Airlock Valves 1P53F0577A and 1P53F0578A; dated July 26, 2007
WO 200277339; Division 1 DG Tripped On Overspeed; dated August 7, 2007
WO 200277351; Replace K1 and K2 relay In Div 1 Diesel Panel; dated August 8, 2007
CR 07-24775; Division 1 Diesel Generator Overspeed Trip; dated August 7, 2007
Gould Instruction Bulletin 0994-150-001-002; Class J Control Relays with Convertible Contacts
ABB Control Instruction 5309 673-1 Y
PMI-0088; Diesel Panel Maintenance; Revision 6
Perry Nuclear Power Plant Maintenance Plan; Emergency Diesel Generator Clean and Inspect Generator Panel; dated August 20, 2007
WO 200104123; PY-1G61F0165 Containment Floor Drain Inboard Isolation; dated September 19, 2007

Section 1R20 Refueling and Outage Activities

Perry Nuclear Power Plant Work Implementation Schedule; B33 'A' Recirculation Pump Motor Repair Cold Shutdown Forced Outage
IOI-12; Maintaining Cold Shutdown; Revision 9
IOI-12; Maintaining Cold Shutdown; Revision 10
ONI-E12-2; Loss of Decay Heat Removal; Revision 16
Notification 600395237; Load Path for 1B33C0001A; dated July 1, 2007
Drawing D-302-574; ECCS Suction Strainer Figure 6.2-83; Revision 12

Section 1R22 Surveillance Testing

WO 200243277; RCIC Steam Line Flow High Channel Functional for 1E31-N684B; dated July 11, 2007
WO 200232278; HPCS Pump and Valve Operability Test; dated September 18, 2007
SOI-R43; Division 1 and 2 Diesel Generator System; Revision 31
CR 07-25401; Division 2 D/G Valve Found Out of Position; dated August 20, 2007
PY-SVI-P45T2003; HPCS Pump and Valve Operability Test, Rev. 12
PY-SVI-E22-T20001; HPCS Pump and Valve Operability Test, Rev. 22

Section 1R23 Temporary Modifications

CR 07-24672; CRD Relief Valve Leaking Challenges Suppression Pool Level - Repeat Issue; dated August 4, 2007
WO 200277178; Control Rod Drive Seal Pressure Relief; dated August 20, 2007
Engineering Change Package 07-0060-001; Install Blank Plate on the Inlet Flange of Valve 1C11F0025A; Revision 0
ECP 07-0089-001; Disconnect Division 1 Wiring for Control Rod 42-31 Position Indication at Panel 1H22-P0071; dated September 15, 2007

Section 2PS2 Radioactive Material Processing and Transportation

10 CFR 61 Independent Laboratory Analysis (RWCU, DAW, SR); Various dates 2006 and 2007
Certificates of Training 49 CFR (Energy Solutions, FENOC, Duratek, and WMG); Selected Personnel; Various dates
CR 05-01642; Issues Identified with Shipment of MS Relief Valves; dated February 28, 2005
FSAR Chapter 11.2; Liquid Radioactive Waste; Revision 12
FSAR Chapter 11.4; Solid Radioactive Waste; Revision 13
FENOC Integrated Training System Report; dated July 17, 2007
Health Physics Instruction (HPI) K0008; Dry Active Waste; Revision 00
Lesson Plan GEN-USDOT-FEN-01; Revision 00
Master Assessment Plan/Schedule 2006-2007; Undated
NOP-OP-2002; Shipment of Radioactive Material/Waste; Revision 05
PAP-0525; Solid Waste Administration; Revision 04
Perry Annual Environment and Effluent Release Reports; dated 2005 and 2006
Process Control Program; Revision 10
PY-C--5-03; Quarterly Audit Report; dated November 2005
PY-SA-07-90; Snapshot Self-Assessment; dated July 2007
Rad Waste Equipment Out of Service Reports; Various dates
Rad Waste Instruction (RWI) G50; RWCU Filter/Demineralizer Backwash Receiving System; Revision 05
Rad Waste Instruction (RWI) G50; Waste Collector System; Revision 07
Rad Waste Instruction (RWI) G50; Spent Resin System; Revision 01

Rad Waste Instruction (RWI) G50; Radwaste Discharge System; Revision 07
Rad Waste Instruction (RWI) G51; Solid Radwaste Solidification System; Revision 09
Scaling Factors (10CFR61 Samples); Various Waste Streams; Various dates
Shipping Record 053045 General Electric Tools/Equipment; dated April 28, 2005
Shipping Record 061006 Condensate Backwash Settling Tank Resin; dated February 01, 2006
Shipping Record 061019 Reactor Water Clean Up Backwash Settling Tank Resin; dated
March 31, 2006
Shipping Record 061023 Reactor Water Clean Up Backwash Settling Tank Resin; dated
April 21, 2006
Shipping Record 063042 Explosive Detector w/Radioactive Source; dated December 01, 2006
Waste to Processor's Log; 2005 and 2006

Section 2OS3 Radiation Monitoring Instrumentation and Protective Equipment

ABACOS 2000 Whole Body Counter Calibration Record; dated July 2005
AMP-100; L70L075 Calibration Records; Various dates 2006 and 2007
AMS-4; L70L231 Calibration Records; Various dates 2007
Breathing Air Bottle/Cylinder Fill Records; Various dates
CDM21 Dosimeter Calibrator; L70L010B Calibration; Various dates 2006 and 2007
CR 05-04834; All Radiation Protection Personnel Physically Capable of Wearing Respiratory
Protective Equipment are Not Qualified; dated July 15, 2005
CR 05-06434; Follow-Up to CR 04-06757 RE: Incorrect Parts Installed in SCBA Equipment;
dated September 05, 2005
CR 05-07449; Three SCBA Regulators Failed Their Monthly Audi Alarm Test; dated
November 04, 2005
CR 06-02868; All Radiation Protection Personnel Physically Capable of Wearing Respiratory
Protective Equipment are Not Qualified; dated July 23, 2006
CR 06-03528; The Maintenance Department Does Not Meet the Minimum Requirement for
Personnel Respirator Qualified; dated August 04, 2006
CR 06-11581; Develop a Plan for Portable Instrumentation Replenishment; dated
December 20, 2006
CR 07-12083; Verify Compliance to Reg Guide 8.15 for Respirator Fit Test Sampling; dated
January 03, 2007
Direct Reading Pocket Dosimeter; L70L010 Calibrations; Various dates 2006 and 2007
Electronic Dosimeters DMC 2000 Calibration Records; Various dates 2005 and 2007
FENOC Integrated Training System; Miscellaneous Training Reports; Various dates
FITS Qualification Matrices: Respiratory Qualifications; dated August 23, 2007
Gilian Lapel Air Sampler; L70L222 Calibration Records; Various dates 2006 and 2007
HPI-A0003; Radiation Monitor Alarm Setpoint Determination; Revision 3
HPI-B0015; Operation of the ABACOS 2000 Whole Body Counting System; Revision 3
HPI-E0009; Control of Radiation and Contamination Detection Instrumentation; Revision 8
HPI-E0010; Operation of Lab Counters; Revision 3
HPI-G0001; Respirator Quantitative Fit Test; Revision 15
HPI-G0007; Maintenance of Respiratory Protective Equipment and Operation of the Respirator
Cleaning/Issue Facilities; Revision 14
HPI-J0001; Health Physics Instrument Control; Revision 4
HPI-L0003; Equipment History; Revision 4
HPI-L0004; Source Control Documentation and Inventory; Revision 6
HPI-L0006; Instrument Quality Checks; Revision 4

Lesson Plan No. GEN-1003-010-01; Respiratory Protective Equipment Training; dated December 2000
Lesson Plan No. GEN-1011-001-01; Self-Contained Breathing Apparatus; dated December 2000
Lesson Plan No. GEN-2003-PY-01; Airline Respirator with Escape Bottles; Revision 0
Lesson Plan No. FB-FBI-PY-11; Self-Contained Breathing Apparatus; Revision 0
Mine Safety Appliances Certificates for Select Members of the Radiation Protection Staff; Various dates
NEI 99-02; Performance Indicators; Revisions 4 and 5
NOP-WM-7015; Respiratory Protection Program; Revision 01
NUREG 0041; Manual of Respiratory Protection Against Airborne Radioactive Material; Revision 1
PAP-0114; Radiation Protection Program; Revision 14
PCM-2; L70L004F Calibration Record; dated January 2007
Perry 1 Technical Specifications; TS Bases and Amendment 131
Perry 1 Updated Final Safety Analysis Report; Chapter 12; Revision 12
PSI-0022; Emergency Plan Training Program; Revision 2
PY-SA-07-97; Snapshot Assessment; RP Instruments; dated August 21, 2007
PY-ICI-C-D19-5; Calibration of Kaman High Range Radiation Monitors; Revision 4
PY-SVI-D21T0267; Control Room Area Radiation Monitor Functional Test; dated August 21, 2007
PY-SVI-D19-T1356-A; Containment High Range Radiation Monitor Channel A Calibration for 1D19-K100; Revision 3
PY-SVI-D19-T1358-A; DW High Range Radiation Monitor Channel A Calibration for 1D19-K100; Revision 0
RO2; L70L030X Calibration Record; dated March 2007
RO2A; L70L040C Calibration Record; dated March 2007
RO7; L70L110A Calibration Record; dated February 2005
Radioactive Source Inventory Log; dated August 21, 2007
Respiratory Protective Equipment History; Various Equipment; Various dates
RPI-1203; Control and Calibration of Radiation Protection Instruments and Standards; Revision 3
SAM-2/9; L70L504 Calibration Records; Various dates 2007
SCBA Unit Inspection Records; Various dates 2006 through July 2007
Teletector; L70L070B Calibration Records; Various dates 2006 and 2007

Section 4OA1 Performance Indicator Verification

CHI-0005; Miscellaneous Sampling Systems; Revision 8
CHI-0053; Operation of the Gamma Spectroscopy System; Revision 10
NOBP-LP-4012; NRC Performance Indicators; Revision 01
Perry Gamma Spectroscopy Analysis for Dose Equivalent Iodine; dated August 22, 2007
Perry Off-Site Dose Calculation Manual (ODCM); Revision 14
RCS Specific Activity Monthly Reports; Various dates 2006 Through July 2007
RCS Gross Activity Report; dated August 22, 2007
SOI-P35; Reactor Plant Sampling; Revision 14
SVI-P35-T3011; Dose Equivalent I-131 Analysis; Revision 6
Technical Specification 3.4.8; RCS Specific Activity and Bases Documents; Amendment No. 131
TID-14844; Calculation of Distance Factors for Power and Test Reactor Sites; Atomic Energy Commission; dated 1962
Control Room Logs; dated April through June 2007
Reactor Power Graphs; dated June 22, 2007

Perry Performance Indicator Data Packages; dated April through June 2007
CR 07-25590; NRC Requesting Details On How Perry Categorizing Performance Indicators;
dated August 23, 2007

Section 4OA2 Identification and Resolution of Problems

CR 07-24207; Safety Culture Monitoring 7-25-07 Declining Trend In MGMT Field Observations;
dated July 25, 2007

CR 07-23078; Negative Trend Fire Doors and Impairments; dated July 6, 2007

CR 07-22249; Trending of Prompt Alert Siren System Failure Siren A4; dated June 18, 2007

CR 07-19624; Declining Trend in Reactor Water Chemistry; dated April 30, 2007

CR 07-19362; An Emerging Trend in The Area of Workmanship During RFO11 Has Been
Identified; dated April 26, 2007

CR 07-23350; Residual Heat Removal B Pump Trip; dated July 11, 2007

Section 4OA3 Event Followup

ONI-E12-2; Loss of Decay Heat Removal; Revision 16

LER 0500440/2007-001-00: Automatic Reactor Protection System Actuation Due To Reactor
Coolant Level Decrease.

CR 07-17751; Individual Injury Occurred in Drywell; dated April 05, 2007

CR 07-17986; Off-Site Contaminated Worker Notification; dated April 09, 2007

CR 07-26811; Basic pH Water Discharged to Major Stream; dated September 2007

Chemistry Sample Reports associated with Basic pH Water Discharged to Major Stream; dated
September 2007

Drawing 743-0001, Plant Area Initial Catch Basin Storm Drainage System, Rev. H

LIST OF ACRONYMS USED

°F	degrees Fahrenheit
ARM	area radiation monitor
CFR	<i>Code of Federal Regulations</i>
CR	condition report
DAW	dry-active waste
DOT	Department of Transportation
EDG	emergency diesel generator
FPI	Fire Protection Instruction
FSAR	Final Safety Analysis Report
LER	Licensee Event Report
NCV	non-cited violation
NIOSH	National Institute for Occupational Safety and Health (NIOSH)
NRC	Nuclear Regulatory Commission
ONI	Off-Normal Instruction
OWA	operator workaround
PAP	Perry Administrative Procedure
PI	performance indicator
RA	risk assessment
RCIC	reactor core isolation cooling
RFPT	reactor feed pump turbine
RHR	residual heat removal
RP	radiation protection
RPS	reactor protection system
RPV	reactor pressure vessel
SCBA	self-contained breathing apparatus
SDP	Significance Determination Process
SOI	System Operating Instruction
SVI	Surveillance Instruction
TTB	time to boil
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
USAR	Updated Safety Analysis Report
VLI	Valve Lineup Instruction
WO	work order