

August 7, 2006

Mr. David A. Christian  
Senior Vice President and  
Chief Nuclear Officer  
Innsbrook Technical Center  
5000 Dominion Boulevard  
Glen Allen, VA 23060-6711

SUBJECT: KEWAUNEE POWER STATION - NRC INTEGRATED INSPECTION  
REPORT 05000305/2006003; 05000305/2006008

Dear Mr. Christian:

On June 30, 2006, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Kewaunee Power Station. The enclosed integrated inspection report documents the inspection findings, which were discussed on July 13, 2006, with Ms. L. Hartz 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.

Based on the results of this inspection, one self-revealed finding and two NRC-identified findings of very low safety significance (Green) were identified. The findings were determined to involve violations of NRC requirements. Additionally, one licensee-identified violation, which was determined to be of very low safety significance, is listed in this report. However, because of the very low safety significance and because they are entered into your corrective action program, the NRC is treating these findings as non-cited violations (NCVs), consistent with Section VI.A.1 of the NRC Enforcement Policy. If you contest any NCV in this report, 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 copies to the Regional Administrator - 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 NRC Resident Inspector at the Kewaunee Power Station.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records System (PARS) component of NRC's document system (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

***/RA by M. Kunowski Acting for/***

Patrick L. Loudon  
Projects Branch 5  
Division of Reactor Projects

Docket No. 50-305  
License No. DPR-43

Enclosure: Inspection Report 05000305/2006003; 05000305/2006008  
w/Attachment: Supplemental Information

cc w/encl: L. Hartz, Site Vice President  
C. Funderburk, Director, Nuclear Licensing  
and Operations Support  
T. Breene, Manager, Nuclear Licensing  
L. Cuoco, Esq., Senior Counsel  
D. Zellner, Chairman, Town of Carlton  
J. Kitsembel, Public Service Commission of Wisconsin  
State Liaison Officer, State of Wisconsin

D. Christian

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T. Breene, Manager, Nuclear Licensing  
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D. Zellner, Chairman, Town of Carlton  
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State Liaison Officer, State of Wisconsin

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No: 50-305  
License No: DPR-43

Report No: 05000305/2006003 and 05000305/2006008

Licensee: Dominion Energy Kewaunee, Inc.

Facility: Kewaunee Power Station

Location: Kewaunee, WI 54216

Dates: April 1 through June 30, 2006

Inspectors: S. Burton, Senior Resident Inspector  
P. Higgins, Resident Inspector  
T. Ploski, Senior Emergency Preparedness Analyst  
W. Slawinski, Senior Radiation Specialist  
M. Phalen, Radiation Specialist

Approved by: Patrick L. Loudon, Chief  
Projects Branch 5  
Division of Reactor Projects

Enclosure

## SUMMARY OF FINDINGS

IR 05000305/2006003 and IR 05000305/2006008; 04/01/2006 - 06/30/2006; Kewaunee Power Station. Maintenance Risk Assessments and Emergent Work Control, Personnel Performance During Non-Routine Evolutions and Events, and Radioactive Gaseous and Liquid Effluent Treatment and Monitoring Systems.

This report covers a 3-month period of inspection by resident inspectors and announced inspections by regional specialists. The emergency preparedness portion of this inspection was conducted by a regional senior emergency preparedness specialist and is being tracked using Inspection Report (IR) 05000305/2006008. Two regional radiation protection specialists conducted a baseline inspection of the radioactive effluent program. Three Green findings with associated non-cited violations (NCVs) were identified. 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. NRC-Identified and Self-Revealed Findings

#### **Cornerstone: Mitigating Systems**

- Green. The inspectors identified a finding of very low safety significance and an associated non-cited violation of Technical Specification 6.8, "Procedures," during a review of a procedure. The licensee had changed the procedure to allow the turbine-driven auxiliary feedwater (TDAFW) pump to be considered available for risk management purposes while the pump control switch was in pull-to-lock during the performance of the surveillance procedure; however, the required Plant Operating Review Committee review and approval for the change was not obtained. Corrective actions, to date, included review of the surveillance procedure by the Plant Operating Review Committee and inclusion into the procedure of additional provisions to ensure availability of the TDAFW pump while the control switch is in pull-to-lock during performance of the procedure. The cause of this finding is related to the cross-cutting area of human performance because of the licensee's failure to follow a plant procedure regarding the review and approval of safety-related procedures.

The finding is greater than minor because it is associated with the procedure quality attribute of the Mitigating Systems cornerstone and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, the failure to provide adequate review and approval of a nuclear safety-related surveillance procedure prior to issuance for use and the failure to include adequate provisions to ensure availability of a safety-related component in the surveillance procedure potentially impacted equipment availability. The finding is of very low safety significance because the answer to all the screening questions in the Significance Determination

Process, Phase 1, screening worksheet in the Mitigating Systems column was “no”. (Section 1R13)

- Green. A self-revealed finding of very low safety significance and an associated NCV of 10 CFR Part 50, Appendix B, Criterion XVI, “Corrective Action,” were identified on April 25, 2006, when a leak due to pipe-wall thinning was identified in a 90E elbow in a service water (SW) line to the ‘B’ emergency diesel generator. This wall-thinning and leak, a condition adverse to quality, resulted in the need to declare the emergency diesel generator inoperable and a shut down of the reactor to allow repair of the leak. In April 2004, a work order to inspect the elbow for wall-thinning was cancelled after wall thickness in a nearby elbow was evaluated by the licensee and deemed acceptable. The extrapolation of inspection results from one elbow to the other elbow was inappropriate. Corrective actions taken by the licensee included replacement of the failed section of SW piping, performance of additional inspections on SW piping, and replacement of other safety-related sections of SW piping. The cause of this finding is related to the cross-cutting area of problem identification and resolution because the licensee failed to promptly identify an issue potentially impacting safety-related piping.

The finding is greater than minor because it is associated with the equipment performance attribute of the Mitigating System cornerstone and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, the failure to conduct a wall-thinning evaluation in April 2004 resulted in the need to take the emergency diesel generator out-of-service and shut down the reactor to allow repair of the pipe. Additionally, the failure to inspect and correct, as necessary, wall-thinning in a safety-related system, if left uncorrected, would become a more significant safety concern through the possible development of a large system leak or the complication of the operations of a safety-related system. The finding is of very low safety significance because the answer to all the screening questions in the Significance Determination Process, Phase 1, screening worksheet in the Mitigating Systems column was “no”. (Section 1R14)

#### **Cornerstone: Public Radiation Safety**

- Green. The inspectors identified a finding of very low safety significance and an associated violation of NRC requirements for the failure to comply with technical specification and Offsite Dose Calculation Manual (ODCM) requirements in the calibration of two liquid discharge radiation monitors listed in the ODCM. Specifically, the radiation monitor high alarm trip functions were not verified with radiation sources during instrument calibration. The licensee entered the problem into its corrective action program and declared the monitors inoperable pending further evaluation.

The finding is greater than minor because it is associated with the plant facilities/equipment and instrumentation attribute of the Public Radiation Safety cornerstone and affected the cornerstone objective of ensuring adequate protection of public health and safety from exposure to radioactive materials released into the public domain. Specifically, not verifying the proper operation of a radiation monitor at its high alarm trip setpoint could result in the use of a monitor that does not properly operate at

the high alarm setpoint and the consequent unintended release of radioactive material to the environment in excess of regulatory limits. The finding is of very low safety significance because actual effluent discharges were adequately analyzed for radioactive content by the licensee prior to release, and the licensee's ability to assess dose from radioactive waste (radwaste) liquid discharges was not impaired, nor were regulatory dose limits or As-Low-As-Is-Reasonably-Achievable dose constraints exceeded due to liquid effluent discharges. (Section 2PS1).

**B. Licensee-Identified Violations**

A violation of very low safety significance, which was identified by the licensee, has been reviewed by the inspectors. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. The violation and corrective actions are listed in Section 4OA7 of this report.



## **REPORT DETAILS**

### **Summary of Plant Status**

Kewaunee operated at full power for the entire inspection period except for brief downpowers to conduct planned surveillance testing activities and for the following exceptions:

- From April 26 through May 23, the Unit was shut down due to a service water (SW) pipe leak on emergency diesel generator (EDG) B; and
- On June 4, reactor power was reduced to 67 percent to accommodate offsite transmission line maintenance.

### **1. REACTOR SAFETY**

#### **Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity**

#### **1R01 Adverse Weather Protection (71111.01)**

##### **a. Inspection Scope**

The inspectors performed a detailed review of the licensee's procedures and a walkdown of two systems to observe the licensee's preparations for adverse weather, including conditions that could result from high temperatures or high winds. The inspectors focused on plant-specific design features for the systems and implementation of the procedures for responding to or mitigating the effects of adverse weather. Inspection activities included, but were not limited to, a review of the licensee's adverse weather procedures and preparations, and a review of analyses and requirements in the Updated Safety Analysis Report (USAR). The inspectors also verified that operator actions specified by plant-specific procedures were appropriate. As part of this inspection, the documents listed in the Attachment were reviewed.

The inspectors evaluated readiness for seasonal susceptibilities for the following for a total of one sample:

- transformer bays;
- substation;
- SW and circulating water systems; and
- auxiliary building and turbine building fan coil units.

##### **b. Findings**

No findings of significance were identified.

## 1R04 Equipment Alignment (71111.04)

### .1 Partial Walkdown

#### a. Inspection Scope

The inspectors performed partial walkdowns of accessible portions of trains of risk-significant mitigating systems equipment. The inspectors reviewed equipment alignment to identify any discrepancies that could impact the function of the system and potentially increase risk. Identified equipment alignment problems were verified by the inspectors to be properly resolved. The inspectors selected redundant or backup systems for inspection during times when equipment was of increased importance due to unavailability of the redundant train or other related equipment. Inspection activities included, but were not limited to, a review of the licensee's procedures, verification of equipment alignment, and an observation of material condition, including operating parameters of equipment in-service. As part of this inspection, the documents listed in the Attachment were reviewed.

The inspectors selected the following equipment trains to assess operability and proper equipment line-up for a total of three samples:

- EDG A with EDG B out-of-service for maintenance;
- residual heat removal (RHR) B with RHR A out-of-service for maintenance; and
- RHR A with RHR B out-of-service for maintenance.

#### b. Findings

No findings of significance were identified.

### .2 Complete System Walkdown

#### a. Inspection Scope

The inspectors performed a complete walkdown of equipment for one risk significant mitigating system. The inspectors walked down the system to review mechanical and electrical equipment line-ups, component labeling, component lubrication, component and equipment cooling, hangers and supports, operability of support systems, and to ensure that ancillary equipment or debris did not interfere with equipment operation. A review of past and outstanding work orders (WOs) was performed to determine whether any deficiencies significantly affected the system function. In addition, the inspectors reviewed the corrective action program database to ensure that any system equipment alignment problems were being identified and appropriately resolved. As part of this inspection, the documents listed in the Attachment were reviewed.

The inspectors selected the following system to assess operability and proper equipment line-up for a total of one sample:

- component cooling water system, including RHR.

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05)

a. Inspection Scope

The inspectors walked down risk significant fire areas to assess fire protection requirements. The inspectors reviewed areas to assess if the licensee had implemented a fire protection program that adequately controlled combustibles and ignition sources within the plant, effectively maintained fire detection and suppression capability, maintained passive fire protection features in good material condition, and had implemented adequate compensatory measures for out-of-service, degraded or inoperable fire protection equipment, systems, or features. The inspectors selected fire areas based on their overall contribution to internal fire risk as documented in the plant's Individual Plant Examination of External Events, or the potential to impact equipment which could initiate or mitigate a plant transient. The inspection activities included, but were not limited to, the control of transient combustibles and ignition sources, fire detection equipment, manual suppression capabilities, passive suppression capabilities, automatic suppression capabilities, compensatory measures, and barriers to fire propagation. As part of this inspection, the documents listed in the Attachment were reviewed.

The inspectors selected the following areas for review for a total of seven samples:

- Fire Zone TU-92, B EDG;
- Fire Zone TU-93, EDG Day Tank Room;
- Fire Zone TU-94, CO<sub>2</sub> Storage Tank Room;
- Fire Zone TU-95A, Bus 1-51 and 1-52 Room;
- Fire Zone TU-95B, 480V (Volt) Switchgear Bus 1-61 and 1-62;
- Fire Zone TU-95C, Auxiliary Feedwater (AFW) Pump Area; and
- Fire Zone TU-91, A EDG.

b. Findings

No findings of significance were identified.

1R06 Flood Protection Measures (71111.06)

.1 Annual Review of Flood Protection Measures

a. Inspection Scope

The inspectors performed an annual review of flood protection barriers and procedures for coping with internal flooding. The inspection focused on determining whether flood mitigation plans and equipment were consistent with design requirements and risk analysis assumptions. The inspection activities included, but were not limited to, a review and/or walkdown to assess design measures, seals, drain systems, contingency

equipment condition and availability of temporary equipment and barriers, performance and surveillance tests, procedural adequacy, and compensatory measures.

The inspectors selected the following equipment for a total of two samples:

- RHR pump flood protection barriers; and
- overhead, non-seismic piping within RHR flood protection barrier boundaries.

b. Findings

No findings of significance were identified.

.2 (Closed) Unresolved Item (URI) 05000305/2005008-02: Potential Common Mode Failure of RHR

In Inspection Report (IR) 05000305/2005008, the inspectors identified an issue associated with potential common-mode failure of both trains of RHR during a randomly or seismically-induced flood. This issue was considered a URI pending completion of an assessment by the NRC. The inspectors noted licensee event report (LER) 05000305/2006-003-00, "Residual Heat Removal Pumps Declared Inoperable Due to Flooding Vulnerabilities," was directly related to this issue. This URI is considered closed and the related inspection will be performed as part of the NRC review of the LER.

1R11 Licensed Operator Regualification Program (71111.11)

a. Inspection Scope

The inspectors performed a quarterly review of licensed operator requalification training. The inspection assessed the licensee's effectiveness in evaluating the requalification program, ensuring that licensed individuals operate the facility safely and within the conditions of their license, and evaluated licensed operator mastery of high-risk operator actions. The inspection activities included, but were not limited to, a review of high risk activities, emergency plan performance, incorporation of lessons-learned, clarity and formality of communications, task prioritization, timeliness of actions, alarm response actions, control board operations, procedural adequacy and implementation, supervisory oversight, group dynamics, interpretations of Technical Specifications (TSs), simulator fidelity, and licensee critique of performance. As part of this inspection, the documents listed in the Attachment were reviewed.

The inspectors observed the following requalification activity for a total of one sample:

- a training crew during an evaluated annual examination simulator scenario.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness (71111.12)

a. Inspection Scope

The inspectors reviewed areas to assess maintenance effectiveness, including maintenance rule activities, work practices, and common cause issues. Inspection activities included, but were not limited to, the licensee's categorization of specific issues, including evaluation of performance criteria, appropriate work practices, identification of common cause errors, extent-of-condition, and trending of key parameters. Additionally, the inspectors reviewed implementation of the Maintenance Rule (10 CFR 50.65) requirements, including a review of scoping, goal-setting, performance monitoring, short-term and long-term corrective actions, functional failure determinations associated with reviewed corrective action program documents, and current equipment performance status. As part of this inspection, the documents listed in the Attachment were reviewed.

The inspectors performed the following maintenance effectiveness reviews for a total of three samples:

- C a function-oriented review of the 4160-V circuit breakers because the licensee designated it as risk significant under the Maintenance Rule;
- C an issue/problem-oriented review of the SW system because the licensee designated it as risk significant under the Maintenance Rule and the system experienced a leak in the supply to EDG A; and
- C an issue/problem-oriented review of the radiation monitors because the licensee designated it as risk significant under the Maintenance Rule and the system experienced intermittent spiking and related alarms.

b. Findings

No findings of significance were identified.

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

a. Inspection Scope

The inspectors reviewed maintenance activities to review risk assessments (RAs) and emergent work control. The inspectors verified the performance and adequacy of RAs, management of resultant risk, entry into the appropriate licensee-established risk bands, and the effective planning and control of emergent work activities. The inspection activities included, but were not limited to, a verification that licensee RA procedures were followed and performed appropriately for routine and emergent maintenance, that RAs for the scope of work performed were accurate and complete, that necessary actions were taken to minimize the probability of initiating events, and that activities to ensure that the functionality of mitigating systems and barriers were performed. Reviews also assessed the licensee's evaluation of plant risk, risk management, scheduling, configuration control, and coordination with other scheduled risk significant work for these activities. Additionally, the assessment included an evaluation of external factors, the licensee's control of work activities, and appropriate consideration of

baseline and cumulative risk. As part of this inspection, the documents listed in the Attachment were reviewed.

The inspectors observed maintenance or planning for the following activities or risk significant systems undergoing scheduled or emergent maintenance for a total of six samples:

- repair and assessment of SW piping leakage to EDG A;
- inspection activities for 4160-V breakers;
- risk assessments for the turbine-driven auxiliary feedwater (TDAFW) pump when plant baseline risk was found to be higher;
- shutdown risk management with EDG A out-of-service;
- risk management when problems were identified shifting reactor coolant pumps during hot shutdown; and
- emergent risk management and maintenance when the TDAFW pump gear box was found to have no oil in the sight glass.

b. Findings

Failure to Properly Review Changes to a Reactor Protection Logic Train Test Procedure

Introduction: The inspectors identified a finding of very low safety significance (Green) and an associated non-cited violation (NCV) of TS 6.8, "Procedures," was identified by the inspectors for a change made to safety-related procedure without the required onsite safety review committee approval.

Discussion: On March 24, 2006, as part of a project to update the plant internal flooding RA, the licensee concluded that the core damage frequency for the Kewaunee plant was significantly higher than previously identified. The internal flooding risk was approximately one order of magnitude higher than previously identified, raising the baseline risk for the facility from approximately  $5 \times 10^{-5}$  to greater than  $3 \times 10^{-4}$ . Also as part of this effort, the licensee determined that if the TDAFW pump became unavailable for any reason, that plant risk would be raised to a red risk level, indicative of a core damage frequency of greater than  $1 \times 10^{-3}$  per year.

On April 6, the licensee recognized that, in order to avoid a red risk level, availability of the TDAFW pump was needed during the performance of test procedure SP-47-062A, "Reactor Protection Logic Train A Test," on April 10. In an attempt to reduce risk to an acceptable level, the licensee revised the procedure. The inspectors reviewed the revised and approved procedure and determined that it allowed the TDAFW pump to be considered available with the pump control switch in pull-to-lock. This was not consistent with industry guidance in Nuclear Energy Institute/Nuclear Management and Resources Council NUMARC 93-01, "Institute Industry Guideline For Monitoring The Effectiveness of Maintenance At Nuclear Power Plants," Revision 3. This document specified the presence of a dedicated operator and written restoration actions in order to consider a component as being available when it was out-of-service for testing. Neither of these provisions were contained in the procedure as issued on April 6. The problem with the procedure was likely due to an inadequate level of review of the proposed revision. The revision had been approved by a senior reactor operator. However,

general nuclear procedure (GNP)-03.01.01, "Directive, Implementing Document, and Procedure Administrative Controls," specified review and approval by the Plant Operating Review Committee (PORC), which had not been conducted. After discussion with the inspectors about the deficiency with the revised procedure and the lack of the proper review and approval, the licensee suspended the surveillance test until the deficiencies in the procedure were corrected and entered the issues into its corrective action program as CAP 033136.

Analysis: The licensee's failure to comply with GNP-03.01.01 is a performance deficiency warranting a significance evaluation. The inspectors determined that the finding is greater than minor because it is associated with the procedure quality attribute of the Mitigating Systems cornerstone and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, the failure to adequately review and approve a safety-related surveillance procedure and the failure to include adequate provisions to ensure availability of a safety-related component in the procedure potentially impacted equipment availability. Also, the inappropriate application of risk for the TDAFW pump, if left uncorrected, would have resulted in inappropriate risk management per 10 CFR 50.65(a)(4).

The inspectors evaluated the finding using Inspection Manual Chapter (IMC) 0609, Appendix A, "Determining the Significance of Reactor Inspection Findings for At-Power Situations." The inspectors answered "no" to all the screening questions in the Significance Determination Process, Phase 1, screening worksheet in the Mitigating Systems column; therefore, this finding is of very low safety significance (Green). The inspectors also determined that the cause of this finding is related to the cross-cutting area of human performance because of the licensee's failure to follow a plant procedure regarding the review and approval of safety-related procedures.

Enforcement: Technical Specification 6.8, Subsection (a), states that "written procedures and administrative policies shall be established, implemented and maintained that meet the requirements and recommendations of Section 5.2.2, 5.2.5, 5.2.15, and 5.3 of ANSI N18.7-1976." American National Standards Institute (ANSI) N18.7-1976, Section 1, indicates that the standard is directed primarily towards administrative controls and quality assurance associated with safety-related activities, equipment, and procedures. Section 5.2.2 of ANSI N18.7-1976, requires that "Procedures shall be followed, and the requirements for use of procedures shall be prescribed in writing." Contrary to the requirements of GNP-03.01.01, "Directive, Implementing Document, and Procedure Administrative Controls," safety-related procedure SP-47-062A, "Reactor Protection Logic Train A Test," was not reviewed and approved by the PORC on or around April 6, 2006, prior to its issuance for use.

Corrective actions, to date, included review of the surveillance procedure by the PORC and inclusion into the procedure of additional provisions to ensure availability of the TDAFW pump while its control switch is in pull-to-lock during performance of the procedure. Because this violation was of very low safety significance and it was entered into the licensee's corrective action program (as CAP 033136), this violation being treated as an NCV, consistent with Section VI.A of the NRC Enforcement Policy. (NCV 05000305/2006003-01).



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

a. Inspection Scope

The inspectors reviewed unplanned, non-routine evolutions to assess operator performance and the potential for operator contribution to the evolution, transient, or event. The review included, but was not limited to, operator logs, pre-job briefings, instrument recorder data, and procedures. Detailed inspections of the April 26, 2006, declaration of an Alert and the May 17, 2006, startup with reactivity management questions were documented in Special Inspection Team Reports 05000305/2006010 and 05000305/2006011, respectively. As part of the current inspection, the documents listed in the Attachment were reviewed.

The inspectors evaluated the following evolutions for a total of four samples:

- on April 26, 2006, response to a SW system leak;
- on April 26, 2006, unplanned shutdown and declaration of an Alert due to an possible anticipated transient without scram;
- on May 17, 2006, operator response for an unplanned reactor shutdown due to the failure of the main turbine turning gear to disengage; and
- on May 17, 2006, operator response during a reactor startup to procedural problems relating to boron concentration and reactivity management questions.

b. Findings

Introduction: A finding of very low safety significance (Green) and an associated NCV of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," for failure to identify and correct a condition adverse to quality was self-revealed on April 25, 2006, when a leak was identified in the SW line to EDG B.

Description: In November 2003, portions of the SW piping to EDG B were radiographed as part of an established piping inspection program. Included in the inspections were a 35E elbow and a 90E elbow. The results of these inspections were documented in CAP 018881. Actions from that CAP included WOs to perform ultrasonic testing (UT) on both elbows to assess wall-thinning and to replace the piping, if necessary. A UT inspection of the 35E elbow was performed in April 2004 and the licensee concluded that wall thickness was adequate. As a result, the WO for pipe replacement was cancelled and the 90E elbow was not inspected. No inspections were performed on any areas of this piping after April 2004.

In April 2006, leakage from under the insulation on the SW supply to EDG B was noted and determined to be from the 90E elbow. During a subsequent buffing operation to prepare the elbow for UT inspection, another leak formed on the elbow's inside radius. Because the section of the SW pipe could not be readily isolated, plant management decided to shut down the plant and repair the piping.

The licensee replaced the elbow and some adjacent pipe and performed UT inspections of other sections of SW piping to ensure acceptable piping wall thickness. As result of these inspections, the licensee replaced piping sections on auxiliary feedwater pump B



and SW pump 1B1 and identified other sections of SW piping that would be replaced at a later date.

Analysis: The inspectors determined that the licensee's failure since April 2004 to inspect the 90E elbow on EDG B without proper justification is a performance deficiency warranting a significance evaluation. The extrapolation of inspection results from one elbow to the other was also inappropriate. The inspectors determined that the finding is greater than minor because it was associated with the equipment performance attribute of the Mitigating System cornerstone and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, the failure to conduct a wall-thinning evaluation in April 2004 (or after) resulted in the need to take the EDG out-of-service and shut down the reactor to allow repair of the pipe. Additionally, the failure to identify and correct a condition adverse to quality (i.e., wall-thinning) in a safety-related system, if left uncorrected, would become a more significant safety concern through the possible development of a large system leak or the complication of the operations of a safety-related system.

The inspectors evaluated the finding using IMC 0609, Appendix A, "Determining the Significance of Reactor Inspection Findings for At-Power Situations." The inspectors answered "no" to all the screening questions in the Mitigating Systems column of the Significance Determination Process (SDP), Phase 1, screening worksheet; therefore, this finding is of very low safety significance (Green).

The inspectors also determined that the finding affected the cross-cutting area of problem identification and resolution because the licensee failed to take effective corrective actions to address previously identified problems with the safety-related SW piping to EDG B.

Enforcement: Appendix B of 10 CFR Part 50, Criterion XVI, "Corrective Action," requires that measures be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and non-conformances are promptly identified and corrected. Contrary to this, the licensee failed to promptly identify and correct a condition adverse to quality (i.e., excessive wall-thinning in SW piping to the B EDG that resulted in a leak), resulting in a shutdown of the reactor. The licensee entered this issue into its corrective action system (as CAP 033245) and performed a Root Cause Evaluation (RCE) 720 to determine the cause of this problem. Corrective actions taken by the licensee included replacement of the failed section of SW piping, performance of additional inspections on and replacement of other safety-related sections of SW piping. Because this violation is of very low safety significance and was entered into the licensee's corrective action program, this violation is being treated as an NCV consistent with Section VI.A of the NRC enforcement policy. (NCV 05000305/200600-02).

## 1R15 Operability Evaluations (71111.15)

### a. Inspection Scope

The inspectors reviewed operability evaluations which affected mitigating systems or barrier integrity to ensure that operability was properly justified and that the component or system remained available. The inspection activities included, but were not limited to, a review of the technical adequacy of the operability evaluations to determine the impact on TSs, the significance of the evaluations to ensure that adequate justifications were documented, and that risk was appropriately assessed. As part of this inspection, the documents listed in the Attachment were reviewed.

The inspectors reviewed the following operability evaluations for a total of eight samples:

- SW pump 1B1 operated at shut-off head for approximately 9 hours;
- incorrect assumption regarding de-rating of EDG during elevated load operation;
- TDAFW pump gearbox found with no oil in sight glass;
- safety-related train A and train B cables 1NI5010 and 1NI5012 not separated properly;
- non-QA (quality assurance)-1 instruments with inappropriate QA-1 interface;
- SW piping to control room air conditioning units susceptible to tornado missiles;
- SW pump cooling and flushing water alternate supply caused loss of safety-related source; and
- non-seismic piping over RHR flood protection barrier boundaries.

### b. Findings

#### (1) Potentially Inappropriate Safety/Nonsafety-Related Interface for Bearing Cooling and Flushing Water to the Safety-Related Service Water Pumps

Introduction: The inspectors identified a URI associated with a potentially inappropriate safety/nonsafety-related interface for bearing cooling and flushing water to the safety-related SW pumps.

Description: On May 31, 2006, a problem with the safety-related SW pump bearing flushing and cooling water was self-revealed when the in-plant operator identified that SW pump 1A2 seal water pressure had decreased to zero pounds per square inch - gauge. As a result, the licensee declared the associated pump inoperable and entered the related TS limiting condition for operation. An investigation by the licensee determined that the cause of the problem was iron deposits that were introduced from the nonsafety-related domestic water supply. Additionally, the licensee's review of the extent-of-condition on the other SW pumps identified that an additional pump on the opposite train was also affected by the same failure mechanism. Subsequently, the licensee indicated that further investigation and an LER were warranted related to a potential common mode failure mechanism.

The inspectors noted that the licensee intended to remove the iron deposits and restore the nonsafety-related source to operation. However, the safety/nonsafety-related interface was potentially inappropriate. Equipment installed in the nonsafety-related

supply was not of an appropriate quality type, and that failure mechanisms potentially existed that could cause the SW pumps to be rendered inoperable. Additionally, the inspectors noted that the nonsafety-related source did not contain a filter to protect the safety-related pumps from foreign material that could be introduced from the nonsafety-related supply. The safety-related supply had a filter that prevented the introduction of unwanted material from Lake Michigan; however, a similar safety-related filter was not installed as an interface between the safety-related pumps and the nonsafety-related source.

This issue was similar to the failure mechanism identified in URI 05000305/2005008-04, "Potential Common Mode Failure of Service Water Pumps," related to the appropriateness of the filters on the safety-related side of this system being able to protect the system from material intrusion from Lake Michigan. That URI remains open pending the licensee's final acceptance of vendor information that indicated that the pumps were operable as long as some minimal detectable flow was available for cooling and flushing of the pump bearings. The inspectors noted that the licensee had prior opportunity to review the nonsafety-related design interface during the resolution of the 2005 issue.

Analysis: The inspectors determined that the safety/nonsafety-related interface for bearing cooling and flushing water to the safety-related SW pumps was potentially inappropriate and is a performance deficiency.

The inspectors concluded that the issue is more than minor because it was associated with the design control and configuration control attributes of the Mitigating Systems cornerstone and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage).

The inspectors also determined preliminarily that the cause of this issue is related to the cross-cutting area of problem identification and resolution because the licensee had prior opportunity to identify the potentially inadequate design interface during its resolution of URI 05000305/2005008-04. The inspectors consider this issue unresolved pending the review of the licensee's investigation and LER (URI 05000305/2006003-03).

(2) Service Water Piping to Control Room Air Conditioning Units Susceptible to Tornado Missiles

Introduction: A URI was identified by the inspectors during a review of an operability evaluation. The inspectors were concerned that the licensee had developed compensatory actions for the possibility of tornado missile damage to piping that could, upon implementation, render the Control Room Post-Accident Recirculation System inoperable.

Discussion: On May 16, 2006, Operability Recommendation (OPR)-106, "Service Water System and Control Room Air Conditioning," was issued by the licensee shortly before plant startup from a forced outage. The inspectors reviewed OPR-106 and determined that the licensee's evaluation (using the TORMIS tornado missile probability evaluation

code), performed in the summer of 2005, identified that portions of the SW system were susceptible to credible tornado missiles.

OPR-106 was issued to evaluate the discovery that portions of Class 1 SW lines that provide cooling water to the control room air conditioning system were susceptible to damage from a tornado missile. These lines provide SW to control room air conditioning units 1A and 1B, shield building filter deluge 1A and 1B, control rod drive mechanism fan coil units 1A and 1B, and containment purge exhaust filter deluge 1B. The OPR concluded that the control room air conditioning system, the SW system, and the control room post-accident recirculation system were operable but nonconforming; and that if the related SW lines were damaged during a tornado, both trains of control room air conditioning might be rendered inoperable. With the loss of air conditioning, the temperature in the control room and relay room, equipment in which was qualified to operate at less than 110 degrees Fahrenheit, would begin to rise.

The above systems were described in the USAR as being Class 1 systems and were required to be protected against damage from tornado missiles. Specifically, Kewaunee USAR, Appendix B, Section B.5, "Protection Of Class 1 Items," required that "the Class 1 items are protected against damage from: (g) Missiles from different sources," and that "these sources comprise: (i) Tornado created missiles." USAR Table B.2.-1, "Classification of Structures, Systems And Components," specified that the control room air conditioning and ventilation system was a Class 1 system and that all portions of the SW system that serve other Class 1 systems were Class 1.

Further, Section B.5 of the USAR established the criterion for protection of Class 1 items as "no single event will cause failure of redundant circuits or Engineered Safety Feature components in a manner such that a single failure after the event could prevent the protective functions of the associated Engineered Safety Features." The inspectors noted that OPR-106 did not consider any subsequent failure mechanisms let alone the impact of such failures on engineered safety features.

Additionally, USAR Section 1.8, Criterion 2 requires that "those systems and components of reactor facilities which are essential to the prevention of accidents which could affect the public health and safety or to mitigation of their consequences shall be designed, fabricated and erected to performance standards that will enable the facility to withstand without loss of capability to protect the public, the additional forces that might be imposed by natural phenomena such as . . . tornadoes." And that "the systems and components designated Class I in Appendix B are designed to withstand, without loss of capability to protect the public, the most severe environmental phenomena . . ."

To ensure that the control room and relay room temperatures did not exceed 110 degrees Fahrenheit, the licensee proposed to open the control room doors and install large temporary fans that would draw outside air from the auxiliary building roof area through the control room and relay room and then exhaust this air onto the turbine building mezzanine level. The OPR specified the use of three (nonsafety-related) temporary fans. Two fans would be placed in the door leading from the relay room out to the turbine building mezzanine. Plastic sheeting and tape would be used to seal the openings between the fans and the door frame to allow the fans to draw suction on the relay room air. A third fan would be placed in the doorway to the control room air

conditioning equipment room and would be used to ventilate that room. The licensee stated that these fans needed to be installed within 4 hours of the SW pipe failure to keep the temperatures in the control room below 110 degrees Fahrenheit. The licensee has also staged materials and equipment required for to repair the SW lines, should they be damaged by a tornado missile. No time-line for this repair was included in OPR-106.

The inspectors noted that the fan configuration developed by the licensee would cause the control room exclusion boundary to be breached, resulting in large amounts of unfiltered air to be drawn from an outside area into the control room, rendering the post-accident recirculation system inoperable. The current licensing basis indicated that the purpose of the post-accident recirculation system was to isolate the control room atmosphere from hazards external to the control room, including radiation, smoke, and other airborne hazards. The licensee's OPR included no analysis of the effect of smoke, hazardous chemicals, explosive gases, or other airborne hazards that might be present in the immediate vicinity of the plant in the aftermath of a tornado and of what effect drawing such substances into the control room would have on control room operations.

Analysis: The inspectors determined that the use of compensatory actions that could render the post-accident recirculation function of the control ventilation system inoperable is a performance deficiency. The inspectors concluded that the issue is more than minor because it was associated with the protection against external factors attribute of the Mitigating Systems cornerstone and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage).

The appropriateness of the compensatory actions in OPR-106 is being reviewed by the NRC's Office of Nuclear Reactor Regulation. Pending completion of that review, this issues is considered an unresolved item (URI 05000305/2006003-04).

#### 1R17 Permanent Plant Modifications (71111.17)

##### a. Inspection Scope

The inspectors reviewed permanent plant modifications, focusing on verification that the design bases, licensing basis, and performance capability of related structures, systems or components were not degraded by the installation of the modifications. The inspectors also verified that the modifications did not place the plant in an unsafe configuration. The inspection activities included, but were not limited to, a review of the design adequacy of the modifications by performing a review, or partial review, of the modifications' impact on plant electrical requirements, material requirements and replacement components, response time, control signals, equipment protection, operation, failure modes, and other related process requirements.

The inspectors selected the following permanent plant modification for review for a total of one sample:

- auxiliary building modifications to protect the RHR system from internal flooding.

b. Findings

No findings of significance were identified.

1R19 Post-Maintenance Testing (71111.19)

a. Inspection Scope

The inspectors verified that the post-maintenance test procedures and activities were adequate to ensure system operability and functional capability. Activities were selected based upon the structure, system, or component's ability to impact risk. The inspection activities included, but were not limited to, witnessing or reviewing the integration of testing activities, applicability of acceptance criteria, test equipment calibration and control, procedural use and compliance, control of temporary modifications or jumpers required for test performance, documentation of test data, system restoration, and evaluation of test data. Also, the inspectors verified that maintenance and post-maintenance testing activities adequately ensured that the equipment met licensing basis, TS, and USAR design requirements. As part of this inspection, the documents listed in the Attachment were reviewed.

The inspectors reviewed post-maintenance activities associated with the following components for a total of four samples:

- SW piping repairs;
- repairs to main feedwater pump 'B' breaker linkage;
- TDAFW pump after gearbox maintenance; and
- floor penetrations not sealed.

b. Findings

No findings of significance were identified.

1R20 Outage Activities (71111.20)

a. Inspection Scope

The inspectors evaluated outage activities for one unplanned shutdown that began on April 26, 2006 (due to a SW leak), the outage that followed, an aborted startup attempt (due to a problem with the main turbine turning gear), and a successful startup on May 23, 2006. The inspectors reviewed activities to ensure that the licensee considered risk in developing, planning, and implementing the outage schedule, developed mitigation strategies for loss of key safety functions, and adhered to operating license and TS requirements to ensure defense-in-depth. The inspection activities included, but were not limited to, a review of the outage plan, monitoring of shutdown and startup activities, control of outage activities and risk, and observation of reduced inventory operations, maintenance and refueling activities. As part of this inspection, the documents listed in the Attachment were reviewed.



In addition to activities inspected utilizing specific procedures, the following represents a partial list of the major outage activities the inspectors reviewed/observed, all or in part:

- review of both outage plans and the ready-backlog;
- control room turnover meetings and selected pre-job briefings;
- reactor shutdowns and cool-downs;
- startup and heatup activities, including criticality, feed pump startup, main turbine generator startup and synchronization, and elements of power escalation to full power; and
- identification and resolution of problems associated with the outage.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors reviewed surveillance testing activities to assess operational readiness and to ensure that risk-significant structures, systems, and components were capable of performing their intended safety function. Activities were selected based upon risk significance and the potential risk impact from an unidentified deficiency or performance degradation that a system, structure, or component could impose on the unit if the condition was left unresolved. The inspection activities included, but were not limited to, a review for preconditioning, integration of testing activities, applicability of acceptance criteria, test equipment calibration and control, procedural use, control of temporary modifications or jumpers required for test performance, documentation of test data, TS applicability, impact of testing relative to performance indicator reporting, and evaluation of test data. As part of this inspection, the documents listed in the Attachment were reviewed.

The inspectors selected the following surveillance testing activities for review for a total of seven samples:

- EDG B availability test;
- RHR train B pump and valve test (containment isolation valves);
- RHR train A pump and valve test (containment isolation valves);
- Reactor protection system train A test;
- Reactor protection system train B test;
- Motor-driven AFW pump A full flow test (inservice testing); and
- Motor-driven AFW pump B full flow test (inservice testing).

b. Findings

No findings of significance were identified.

#### 1R23 Temporary Plant Modifications (71111.23)

##### a. Inspection Scope

The inspectors reviewed a temporary modification to assess the impact of the modification on the safety function of the associated system. The inspection activities included, but were not limited to, a review of design documents, safety screening documents, USAR, and applicable TSs to determine if the temporary modification was consistent with modification documents, drawings, and procedures. The inspectors also reviewed the post-installation test results to confirm that tests were satisfactory and the actual impact of the temporary modification on the permanent system and interfacing systems were adequately verified. As part of this inspection, the documents listed in the Attachment were reviewed.

The inspectors selected the following temporary modification for review for a total of one sample:

- Disconnect cable 1N0245 from safeguards power in RR-104.

##### b. Findings

No findings of significance were identified.

#### **Cornerstone: Emergency Preparedness**

#### 1EP4 Emergency Action Level and Emergency Plan Changes (71114.04)

##### a. Inspection Scope

The inspectors completed screening reviews of Revision 29 of the Kewaunee Power Station's radiological Emergency Plan and Revision AP to Emergency Plan Implementing Procedure AD-02 to determine whether changes identified in these revisions may have reduced the effectiveness of the licensee's emergency planning and to verify that emergency action level and definition changes associated with NRC Bulletin 2005-02, "Emergency Preparedness and Response Actions for Security-Based Events," were adequately incorporated in these revisions. The screening reviews of these revisions do not constitute approval of the changes and, as such, the changes are subject to future NRC inspection to ensure that the emergency plan continues to meet NRC regulations.

These activities constituted one inspection sample.

##### b. Findings

No findings of significance were identified.



1EP6 Drill Evaluation (71114.06)

a. Inspection Scope

The inspectors selected emergency preparedness exercises that the licensee had scheduled as providing input to the Drill/Exercise Performance Indicator. The inspection activities included, but were not limited to, the classification of events, notifications to offsite agencies, protective action recommendation development, and drill critiques. Observations were compared with the licensee's observations and CAPs. The inspectors verified that there were no discrepancies between observed performance and performance indicator reported statistics. As part of this inspection, the documents listed in the Attachment were reviewed.

The inspectors selected the following emergency preparedness activity for review for a total of one sample:

- an integrated facility drill, conducted on June 1, 2006, that included the Technical Support Center, Operational Support Center, Emergency Operations Facility, and Joint Public Information Center. Drill notifications were simulated with state, county, and local agencies for a site area emergency and general emergency classification.

b. Findings

No findings of significance were identified.

**2. RADIATION SAFETY**

**Cornerstone: Public Radiation Safety**

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

.1 Inspection Planning

a. Inspection Scope

The inspectors reviewed the most recent Annual Radioactive Effluent Release Reports, dated April 28, 2006, and April 12, 2005; and the most recent Annual Environmental Monitoring Reports; dated April 28, 2006, and April 26, 2005, along with current effluent release data to determine if the program was implemented as described in the Radiological Environmental Technical Specifications/Offsite Dose Calculation Manual (RETS/ODCM) and the USAR. The effluent reports were also evaluated to determine if there were any significant changes to the ODCM or to the radioactive waste (radwaste) system design and operation, and if anomalous results were adequately resolved. There were no significant changes to the ODCM and no significant modifications had been made to the radwaste system design and operation.

The RETS/ODCM and USAR were reviewed to identify the effluent radiation monitoring systems and associated flow measurement devices. Licensee records, including CAPs,

self-assessments, audits, and special reports, were reviewed to determine if there were any radiological effluent performance indicator occurrences or any unanticipated offsite releases of radioactive material for follow-up. The USAR description of all radwaste systems was reviewed. This review represented one sample.

b. Findings

No findings of significance were identified.

.2 Onsite Inspection

a. Inspection Scope

The inspectors walked down the major accessible components of the gaseous and liquid release systems, including radiation and flow monitors, tanks, and vessels. This was done to observe current system configuration with respect to the description in the USAR, ongoing activities, and equipment material condition. Selected effluent pathways were walked down. This review represented one sample.

The inspectors reviewed diagrams of the radioactive liquid waste processing and release systems to determine how liquid radwaste was processed, and to determine if appropriate treatment equipment was used and that radioactive liquid waste was processed in accordance with procedural requirements. Liquid effluent release packages that included projected doses to the public were reviewed to determine if regulatory effluent release limits were exceeded. The inspectors reviewed diagrams of the radioactive gaseous effluent processing and release systems, and observed a sample collection and analysis to determine if appropriate treatment equipment was used and if the radioactive gaseous effluent was processed and released in accordance with RETS/ODCM requirements. Radioactive gaseous effluent release data, including the projected doses to members of the public, were evaluated to determine if regulatory effluent release limits were exceeded. This review represented one sample.

The inspectors reviewed the licensee's process for making releases with inoperable effluent radiation monitors to determine if adequate compensatory sampling and analyses was performed, and to determine if an adequate defense-in-depth was maintained against an unmonitored, unanticipated release of radioactive material to the environment. This included review of the licensee's projected radiological doses to members of the public. This review represented one sample.

There had been no significant changes made to the ODCM or to the liquid and gaseous radwaste system design, procedures, or operation, including effluent monitoring and release controls, since the last inspection. This review represented one sample.

The inspectors reviewed a selection of various dose calculations to determine if the licensee properly calculated the offsite dose from radiological effluent releases, and to determine if any annual RETS/ODCM (i.e., Appendix I to 10 CFR Part 50) values were exceeded. This review represented one sample.

The inspectors reviewed air cleaning system surveillance test results for the shield building and auxiliary building ventilation systems to determine if the system was operating within the licensee's acceptance criteria. The inspectors reviewed surveillance test results for the vent flow rates and determined if the flow rates were consistent with USAR values. This review represented one sample.

The inspectors reviewed records of instrument calibrations performed since the last inspection for each point of discharge effluent radiation monitor and flow measurement device. The current effluent radiation monitor alarm setpoint values were reviewed for agreement with RETS/ODCM requirements. The inspectors also reviewed calibration records of radiation measurement (i.e., counting room) instrumentation associated with effluent monitoring and release activities. Quality control data for the radiation measurement instruments were evaluated to determine if the instrumentation was operating under statistical control and that any problems observed were addressed in a timely manner. This review represented one sample.

The inspectors reviewed the results of the inter-laboratory comparison program to determine the adequacy of the quality of radioactive effluent sample analyses performed by the licensee. The inspectors reviewed the licensee's quality control evaluation of the inter-laboratory comparison test results. In addition, the inspectors reviewed the results of quality assurance audits to determine if the licensee met the requirements of the RETS/ODCM. This review represented one sample.

b. Findings

Introduction: The inspector identified a finding of very low safety significance (Green) and an associated NCV of NRC requirements for the failure to calibrate the Waste Discharge Liquid Radiation Monitor (R-18) and the Steam Generator Blowdown Radiation Monitor (R-19) in accordance with ODCM requirements.

Description: These radiation monitors measure radioactivity in liquid effluents discharged to the environment from the plant. Monitor alarm setpoints were established conservatively to ensure that regulatory dose limits associated with liquid discharges were met, as determined by the licensee's analyses of the liquid effluent samples. Upon monitor high alarm, releases would be terminated by closure of valves in the discharge lines.

The liquid discharge effluent radiation monitors were last calibrated in February 2006, using radiation sources of various activities. The sources were used to determine the monitor's range and accuracy, as required by the ODCM. The sources generated detector responses up to  $5.55 \times 10^5$  counts per minute (cpm) (R-18) and  $5.65 \times 10^5$  cpm (R-19). However, the monitors were set to alarm at the higher values of  $3.22 \times 10^6$  cpm (R-18) and  $1.29 \times 10^6$  cpm (R-19), respectively. The licensee entered the problem into its corrective action program (as CAP 033340 and CAP 035605) and declared the monitors inoperable pending further evaluation.

Analysis: This condition where the instrument calibrations did not encompass the entire instrument response range to include its alarm setpoints, and only extended up to a nominal 18 to 44 percent of the instrument setpoints, is determined to be a performance

deficiency because the licensee failed to satisfy TS requirements for instrument calibration. The inspectors concluded that the finding is greater than minor in accordance with IMC 0612, "Power Reactor Inspection Reports," Appendix B, "Issue Disposition Screening," dated September 30, 2005. Specifically, the inspectors determined that not calibrating the ODCM instruments across their entire response range, using radiation sources of known values, was associated with the Public Radiation Safety cornerstone attribute of Plant Facilities/Equipment and Instrumentation; and potentially affected the cornerstone objective of ensuring adequate protection of public health and safety from exposure to radioactive materials released into the public domain. Specifically, not verifying the proper operation of a radiation monitor at its high alarm setpoint could result in the use of a monitor that does not properly operate at the high alarm setpoint and the consequent unintended release of radioactive material to the environment in excess of regulatory limits. Therefore, the issue is greater than minor and represented a finding which was evaluated using the SDP.

Since the finding involved the effluent release program, the inspectors utilized IMC 0609, Appendix D, Public Radiation Safety SDP, to assess its significance. Proper instrument response and linearity to radiation was determined throughout most of the monitors' response range during the calibration performed in February 2006. Also, actual effluent discharges were sampled and analyzed for radioactive content by the licensee prior to release. Given that information, and since the licensee's ability to assess dose from radwaste liquid discharges was not impaired, the inspectors concluded that the finding is of very low safety significance (Green).

Enforcement: Technical Specification 6.16.a.2 requires, in part, that the radioactive effluent control program be contained in the ODCM and include limitations on the functional capability of radioactive liquid monitoring instrumentation, including surveillance tests and setpoint determinations. The ODCM requires that the Waste Discharge Liquid Radiation Monitor (R-18) and the Steam Generator Blowdown Radiation Monitor (R-19) receive a channel calibration once per refueling cycle, not to exceed 18 months. The TS definition for channel calibration states that "Channel calibration consists of the adjustment of channel output as necessary, such that it responds with acceptable range and accuracy to known values of the parameter that the channel monitors. Calibration shall encompass the entire channel, including alarm and/or trip, and shall be deemed to include the channel functional test." In this instance, the 'known values of the parameter that the channel monitors' is radiation. Contrary to this, the February 2006 calibrations for these effluent radiation monitors did not include their high alarm trip points. The failure to meet the ODCM defined calibration requirements for these monitors is a violation of TS 6.16.a.2. Since the licensee documented this issue in its corrective action program (as CAP 033340 and CAP 035605), and because this finding is of very low safety significance, it is being treated as an NCV (NCV 05000305/2006003-05).

### .3 Identification and Resolution of Problems

#### a. Inspection Scope

The inspectors reviewed the licensee's self-assessments, audits, and special reports related to the radioactive effluent treatment and monitoring program since the last

inspection to determine if identified problems were entered into the corrective action program for resolution. The inspectors also determined whether the licensee's self-assessment program 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 radioactive effluent treatment and monitoring program, 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.

This review represented one sample.

b. Findings

No findings of significance were identified.

**4. OTHER ACTIVITIES**

4OA2 Identification and Resolution of Problems (71152)

.1 Routine Review of Identification and Resolution of Problems

a. Inspection Scope

As part of the routine inspections documented above, the inspectors verified that the licensee entered the problems identified during the inspection into its corrective action program. Additionally, the inspectors verified that the licensee was identifying other issues at an appropriate threshold and entering them in the program, and verified that problems in the program were properly addressed for resolution. Attributes reviewed included: complete and accurate identification of the problem; timeliness was commensurate with the safety significance; evaluation and disposition of performance issues, generic implications, common causes, contributing factors, root causes, extent-of-condition reviews, and previous occurrences reviews were proper and adequate; and classification, prioritization, and focus were commensurate with safety and sufficient to prevent recurrence of the issue.

b. Findings

No findings of significance were identified.

.2 Daily Corrective Action Program Reviews

a. Inspection Scope

To assist with the identification of repetitive equipment failures and specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the corrective action program. This review was accomplished by reviewing daily CAP summary reports and attending corrective action review board meetings.

b. Findings

No findings of significance were identified.

.3 Semi-Annual Trend Review

a. Inspection Scope

The inspectors performed a review of the corrective action program and associated documents to identify trends that could indicate the existence of more significant safety issues. The inspectors' review was focused on trending program deficiencies, but also considered the results of daily inspector CAP item screening discussed in Section 4OA2.2, licensee trending efforts, and licensee human performance results. The inspectors' review nominally considered the 6-month period of January through June 2006, although some examples extended beyond those dates when the scope of the trend warranted.

The inspectors reviewed adverse trend corrective action program items associated with various events that occurred during the period. The review also included issues documented outside the normal corrective action program in major equipment problem lists, repetitive and/or rework maintenance lists, departmental problem/challenges lists, system health reports, quality assurance audit/surveillance reports, self-assessment reports, and maintenance rule assessments. The specific items reviewed are listed in the Attachment to this report. The inspectors compared and contrasted their results with the results contained in the licensee's CAP trending documents. Corrective actions associated with a sample of the issues identified in the licensee's trend report were reviewed for adequacy. Early in this review, the inspectors became aware of a CAP that specifically addressed the licensee's trending program. The inspectors focused the inspection on the corrective actions associated with the trending program.

The inspectors also evaluated the report against the requirements of the licensee's corrective action program as specified in the associated administrative procedure and of 10 CFR 50, Appendix B. Additional documents reviewed are listed in the Attachment to this report.

Assessment and Observations

On October 12, 2005, the licensee identified a weakness in the trending program as part of related self-assessment (CAP 029587). Deficiencies included a failure to publish a trend report as required by licensee procedures, inappropriate exclusion of trending



flags called "Hot Buttons" during a forced outage, and a Quality Check backlog of apparent cause evaluations and condition evaluations that impacted the availability of timely and accurate data used in the trending program.

The inspectors noted the corrective actions planned or implemented for the deficiencies were to construct and publish a report, establish new procedural guidance for "Hot Button" assignment, and establish new criteria for requiring corrective action documents to undergo a routine quality check. The inspectors had the following observations in regards to these corrective actions:

- C The procedurally required quarterly trending report did not indicate that the trending program was the focus of ongoing corrective actions. The inspectors concluded that this represented a missed opportunity to engage the program users and to receive input pertinent to program enhancements.
- C A procedure change request was initiated and subsequently completed in February 2006. One element of the procedural change resulted in modifying the method for recording "Hot Button" data. Additionally, the licensee began an initiative to encourage employees to write more CAPs. In March 2006, the number of CAPs exceeded February's total by more than 300, indicating a greater than 60 percent increase from February. The First Quarter Trend Report documented the initiation of seven CAPs to investigate the rise in "Hot Button" assignments. The inspectors found no evidence that the licensee recognized the correlation between recent program changes and the data presented in the Trend Report.
- C In CAP 029982, the licensee established an administrative trend threshold of 400 items in the Quality Check backlog. Also, a recently implemented procedure change removed the quality check requirement for 'C' and 'D' level CAPs, which represent approximately 80 percent of the current backlog. No adjustment was made to the administrative limit for establishing a negative trend in the backlog subsequent to the procedure change. The inspectors concluded that maintaining the administrative limit at 400, while reducing the data set by 80 percent without justification, resulted in ineffective management of the backlog and diluted information useful to the improvement of the corrective action process.
- C The inspectors found the corrective actions associated with the trending program lacked milestones and preplanned evaluation points sufficient to assess the overall performance of the program. The corrective actions appeared to be of a "broke-fix" nature and were not as detailed as one would expect for the corrective actions associated with a program.

The licensee has planned to evaluate, during July 2006, the effectiveness of the corrective actions taken.

.4 Selected Issue Follow up (Annual Sample): Quality Assurance Program Type and Program Issues

Introduction: The inspectors previously identified potential programmatic issues associated with quality assurance (QA) type requirements, as documented in IR 05000305/2006002, Section 1R17. During this period, the licensee had identified multiple issues that identified further problems with in-plant installation of components or parts with a quality type less than required. Because of the importance of having equipment installed in the facility that was of an appropriate quality type, the inspectors elected to review quality typing as a selected issue follow-up sample.

Assessment and Observations: The inspectors determined that, since 2004, the licensee had identified concerns with various aspects of the Kewaunee Nuclear Power Plant (KNPP) QA program, including a lack of guidance to determine augmented quality requirements and a lack of ownership for development and maintenance of a "Quality List" program. Further, the licensee performed several audits and assessments for the related issues in the first quarter of 2006. Subsequent to the initial assessments and during the second quarter of 2006, the licensee initiated several CAPs for additional problems with in-plant installation of components or parts with a quality type less than required. As a result, the licensee re-evaluated related prior assessments of this issue and found weaknesses in those evaluations.

The inspectors found that the licensee review was a work-in-progress and that the ability to draw a conclusion from the licensee's assessments would be incomplete. The inspectors concurred with the licensee's preliminary conclusions that indicated that reviews performed to date lacked rigor and that past corrective actions were not fully effective in correcting these conditions. The inspectors reviewed corrective action documents associated with the newly identified issues and concluded that these issues had been appropriately dispositioned within the licensee's corrective action program.

4OA6 Meetings

.1 Exit Meeting

The inspectors presented the inspection results to Ms. Hartz and other members of licensee management on July 13, 2006. 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

Interim exits were conducted for:

- The radioactive gaseous and liquid effluent treatment and monitoring systems program inspection with Mr. M. Gaffney and Mr. T. Webb on April 28, 2006; and
- Emergency preparedness inspection with Mr. S. Wood on May 31, 2006.



#### 4OA7 Licensee-Identified Violations

The following violation of very low safety significance was identified by the licensee and is a violation of NRC requirements which meets the criteria of Section VI of the NRC Enforcement Manual, NUREG-1600, for being dispositioned as an NCV.

##### **Cornerstone: Public Radiation Safety**

Changes made to Revision Y of licensee procedure N-GWP-32B, "Gaseous Waste Processing and Discharge System," in 2001 were not adequately verified to ensure that the change in the pressure readings of Waste Gas Decay Tank (WGDT) did not adversely affect the implementation of another station procedure (HP-01.012 RETS Code Computer Program Operating Guide). Specifically, the changes made to procedure N-GWP-32B, "Gaseous Waste Processing and Discharge System," generated an inaccurate WGDT volume that was then used to calculate radioactive WGDT release activity and project the associated offsite dose. Consequently, the licensee was in violation of its radioactive effluent controls program (TS 6.16.b.1.c) and the ODCM for the failure to accurately determine and report offsite doses from WGDT releases from 2002-2005. As described in CAP 030430, the licensee's radiation protection staff identified in December 2005 that the WGDT volume calculation used in the RETS Code computer program did not fully account for the purge volume of the tank. Radioactive release data for the WGDT were recalculated using accurate WGDT volumes, and the licensee determined that the calculational impact was minimal (i.e., 0.01 percent), validated compliance with its ODCM, and confirmed that no operational or regulatory limits were exceeded at any time as a result of this problem. The finding is of very low safety significance because it did not result in an unmonitored release nor were any dose limits approached. Corrective actions, including revising the applicable procedures, have been implemented by the licensee. The licensee also plans to rectify reporting errors in its annual effluent reports.

ATTACHMENT: SUPPLEMENTAL INFORMATION

## **SUPPLEMENTAL INFORMATION**

### **KEY POINTS OF CONTACT**

#### Licensee

R. Adams, Radiation Protection Supervisor  
L. Armstrong, Site Engineering Director  
S. Baker, Radiation Protection Manager  
T. Breene, Regulatory Affairs Manager  
K. Davison, Plant Manager  
W. Flint, Chemistry Manager  
D. Gauger, Chemistry Supervisor  
M. Hale, Radiation Protection Manager  
L. Hartz, Site Vice-President  
W. Henry, Outage and Scheduling Manager  
W. Hunt, Maintenance Manager  
J. Ruttar, Operations Director  
S. Wood, Emergency Preparedness Manager  
M. Hale, Radiation Protection Manager  
R. Adams, RP Supervisor  
D. Gauger, Chemistry Supervisor  
N. Wenborne, Licensing Lead

#### Nuclear Regulatory Commission

P. Loudon, Chief, Division of Reactor Projects, Branch 5

### **LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED**

#### Opened

05000305/2006003-03	URI	Potentially Inappropriate Interface for Service Water Pump Bearing Cooling and Flushing Water (Section 1R15.b.(1))
05000305/2006003-04	URI	Adequacy of Compensatory Actions for Potential Turbine Missile Strike of Control Room Ventilation Cooling (Section 1R15.b.(2))

#### Opened and Closed

05000305/2006003-01	NCV	Reactor Protection System Procedure Revised Without Proper Review (Section 1R13)
05000305/2006003-02	NCV	Leak Developed in Service Water Pipe After Wall-Thinning Evaluation Was Cancelled (Section 1R14)

05000305/2006003-05	NCV	Failure to Properly Calibrate the Waste Discharge Liquid and the Steam Generator Blowdown Radiation Monitors (Section 2PS1)
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Closed

05000305/2005008-02	URI	Potential Common Mode Failure of the Residual Heat Removal System (Section 1R06)
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Discussed

05000305/2005008-04	URI	Potential Common Mode Failure of Service Water Pumps (Section 1R15.b.(1))
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## LIST OF DOCUMENTS REVIEWED

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

### 1R01 Adverse Weather

GMP-172; Tornado Missile Hazard Monthly Inspection; January 17, 2006  
E-0-05; Response to Natural Events; Revision U  
KNPP Summer Equipment Reliability 2005

### 1R04 Equipment Alignment

CAP 033624; Add Oil to Component Cooling Pump B Outboard Bearing Oil Bulb  
CAP 033529; Insufficient Closure Documentation for CAP 018655  
CAP 031882; Out of Tolerance Found on Component Cooling Water Pressure Auto Start Switch  
GNP-08.04.01; Shutdown Safety Assessment; Revision P  
N-CC-31; Component Cooling System Operation; Revision AH  
SP-42-047B; Diesel Generator B Operational Test; Revision AE  
N-RHR-34; Residual Heat Removal System Operation; December 15, 2005

### 1R05 Fire Protection

A-537; 1B Diesel Generator and Diesel Generator Day Tank Room; Revision B  
A-538; CO<sub>2</sub> Storage Tank Room; Revision B  
A-539; Bus 1-51 and 1-52 Room; Revision B  
A-540; 480V Switchgear Bus 1-61 and 1-62 and AFW Pump Area; Revision C

### 1R11 Licensed Operator Requalification Program

LRC-06-SEE05; 2006 Evaluation SEG 05; Revision A

### 1R12 Maintenance Effectiveness

CAP 018881; Radiography Determines Pitting Occurring in SW Supply to DG [Diesel Generators] HXs [Heat Exchangers]  
CEO 13897; Radiography Determines Pitting Occurring in SW Supply to DG HXs  
CA 023207; Update CAP 018881 and CEO 13897 - Identified Work on B DG SW Piping Canceled  
WO 03-014282-000; 4-Inch Valve-Manual-Inlet at Diesel Generator No 1B Heat Exchange  
Drawing —898; S.W. from 24-Inch HDR to Diesel Generator 1B Cooling Water Heat Exchanger; Revision D

WO 06-005626-000; Plant System/Service Water - Sample and Analyze Areas of Interest on SW Piping to the EDGs  
GMP-208; The Opening and Sealing of Penetration Seals; Revision K  
WO 06-005612-000; Plant System/Service Water - Replace 4-Inch Service Water Pipe Section Upstream of SW-300B  
SOP-SW-02-28; Drain and Fill Train B Service Water Header; Original Revision  
SOP-SW-02-28; Drain and Fill Train B Service Water Header; Revision A

#### 1R13 Maintenance Risk Assessments and Emergent Work Control

CAP 018881; Radiography Determines Pitting Occurring in SW Supply to DG HXs  
CEO 13897; Radiography Determines Pitting Occurring in SW Supply to DG HXs  
CA 023207; Update CAP 018881 and CEO 13897 - Identified Work on B DG SW Piping Canceled  
WO 03-014282-000; 4 Inch Valve-Manual-Inlet at Diesel Generator 1B Heat Exchanger Drawing —898; S.W. from 24" HDR to Diesel Generator 1B Cooling Water Heat Exchanger; Revision D  
WO 06-005626-000; Plant System/Service Water - Sample and Analyze Areas of Interest on SW Piping to the EDGs  
GMP-208; The Opening and Sealing of Penetration Seals; Revision K  
WO 06-005612-000; Plant System/Service Water - Replace 4-Inch Service Water Pipe Section Upstream of SW-300B  
SOP-SW-02-28; Drain and Fill Train B Service Water Header; Original Revision  
SOP-SW-02-28; Drain and Fill Train B Service Water Header; Revision A  
CAP 033058; In Relay Rack 119 Four Boxes Did Not Have Proper Electrical Boundary Assignment  
CAP 033059; In Relay Rack 120 Two Boxes Did Not Have Proper Electrical Boundary Assignment  
CEO 17533; In Relay Rack 119 Four Boxes Did Not Have Proper Electrical Boundary Assignment  
PTE 94-0081; 4160V Circuit Breaker Parts; Revision 2  
PTE 93-0031; Oils, Greases, and Lubricants; Revision 38  
General Electric Instructions GEH-908M; Control and Instrument Switches; Types SB-1, SB-9, and SB-10  
Kewaunee Power Station Special Inspection April 26, 2006 Event - List of Last Five Years of CAPs on Balance of Plant 4kV [kilovolt] McGraw Edison Breakers; List of WOs Issued  
CAP 033361; Maintenance for the 4160 Breakers and Cubicles Need Improvement  
CAP 033815; 4kV Breaker Extent of Condition Recommendation  
CAP 033277; Alert Declared after Trip of Feedwater Pumps Without Turbine/Reactor Trip  
CAP 032761; 1-601BKR RAT Supply to Bus 6  
CAP 033492; Cables 1N15010 and 1N15012 Associated with Both Safety Trains  
Generic Letter 2003-01; Control Room Habitability; June 12, 2003  
Nuclear Management Company (NMC) Letter; Control Room Habitability 60-Day Response; August 7, 2003  
NMC Letter; Control Room Habitability - Response to Commitments; November 25, 2003

NMC Letter; Control Room Habitability - Supplemental Response Commitment Extension; March 15, 2005  
 NMC Letter; Control Room habitability - Supplemental Response; April 1, 2005  
 OPR-106; Service Water System and Control Room Air Conditioning [CRAC]; Revision 1  
 CAP 027495; Service Water Supplies to CRAC Units Potentially Impacted by Tornado Missiles  
 OPR 000106; Service Water Supplies to CRAC Units Potentially Impacted by Tornado Missiles  
 CAP 033788; OPR-106 Insufficient Details for Repairs to Service Water to CRAC Pipe Failure  
 CEO 016002; Service Water Supplies to CRAC Units Potentially Impacted by Tornado Missiles  
 CA019700; Service Water Supplies to CRAC Units Potentially Impacted by Tornado Missiles  
 CA020061; Verify Final X10072 Does Not Invalidate OPR-106  
 CA020072; Service Water Supplies to CRAC Units Potentially Impacted by Tornado Missiles  
 DCR021560; Service Water Supplies to CRAC Units Potentially Impacted by Tornado Missiles  
 CAP 033789; Non-Seismic Lines in the RHR Flood Barrier Envelope  
 CEO 17776; Non-Seismic Lines in the RHR Flood Barrier Envelope  
 CAP 034025; RWST Purification Lines to the SFP Pre and Post Filters Analysis is Complete  
 EN 42589; Shift Manager Notified of Flooding Concern That Could Impact Both Trains of Residual Heat Removal System; May 18, 2006  
 Summary of Lines Currently Isolated for RHR Flooding Concerns  
 OBD 000136; Engineering Justification Schedule Extension for Return to Original Condition  
 OBD 000135; Engineering Justification Schedule Extension for Return to Original Condition  
 Safety Monitor Risk Look Ahead; April 3 - April 10, 2006  
 Safety Monitor Risk Look Ahead; April 17 - April 24, 2006  
 Emergent Work Risk Evaluations; March 31, April 7, April 9, April 10, April 12, April 13, April 16, April 17, and April 19, 2006  
 GNP-08.21.01; Risk Assessment for Plant Configuration; Revision I  
 GNP-03.30.06; Plant Status and Configuration Control; Revision B  
 E-0-05; Response to Natural Events; Revision U  
 SP-47-062A; Reactor Protection Logic Train A Test; Revision U  
 SP-47-062A Tracking and Processing Record; April 12, 2006  
 50.59 Applicability Review of SP-47-062A; Reactor Protection Logic Train A Test; April 12, 2006  
 SP-47-062A; Reactor Protection Logic Train A Test; Revision V  
 SP-47-062A Tracking and Processing Record; April 13, 2006  
 CAP 033366; Penetration 248 Not Properly Configured  
 CAP 033344; Penetrations Not Properly Sealed  
 Calculation/Evaluation C11078; Predict Auxiliary Building Mezzanine Area Temperature Following HELB in 633 Foot Elevation Assuming Boundary Penetration Area of 55 Square Inches  
 Drawings A-525-1, A-525-2; Steam Exclusion Boundary; Revision D

Drawing 237127A; Auxiliary Building - El 606 Feet; Reinforced Concrete Wall Plan  
Drawing S-334; Auxiliary Building and Fuel Handling Area Reinforced Concrete Typical  
Details and Sections; Revision J  
Drawing —1735-5; Sections and Details Sealing of Pipe and Cable Tray Penetrations for  
Concrete and/or Masonry Floors and Walls; Revisions C and D  
Drawing —495; Sections and Details Sealing of Pipe Penetrations for Concrete and/or  
Masonry Floors and Walls; Revision M

#### 1R15 Operability Evaluations

CAP 033709; Service Water Pipe Thinning  
CAP 033788; OPR-106 Insufficient Details for Repairs to Service Water to CRAC Pipe  
Failure  
CAP 032913; Update CAP 018881 and CEO 13897 - Identified Work on B DG SW  
Piping Canceled  
CAP 033245; Extent of Condition: Service Water Leak on Line Branch to Diesel  
Generator B; May 11, 2006  
CAP 018881; Radiography Determines Pitting Occurring in SW Supply to DG HXs  
CEO 13897; Radiography Determines Pitting Occurring in SW Supply to DG HXs  
CAP 033404; SW Pump 1B1 Running With Discharge Valve Closed  
CAP 034030; Incorrect Assumption Regarding De-rating of EDGs During Elevated Load  
Operation  
CAP 033492; Cables 1N15010 and 1N15012 Associated with Both Safety Trains  
CA 023457; Cables 1N15010 and 1N15012 Associated with Both Safety Trains  
DCR 3644; Electrical Separation of ICCMS Cables  
ES-9010; Electrical Cable Installation and Separation Criteria - In Plant; Revision 2  
CAP 034294; NRC Question on Service Water  
CAP 032596; Back-up Bearing Lube Water Supply Pressure Low for A2 Service Water  
Pump  
CAP 034310; Need Change to Procedure PMP 02-07- Cleaning of Bearing Lube Water  
Supply Pipes and Tubing  
CA023977; CAPR - Upgrade SW Inspection and Mitigation Plan  
CAP 034339; N-SW-02 Guidance for Setting SW Pump Gland Water Flow Needs  
Revision  
CAP 034269; SW Pump A2 Backup Seal Water Regulator Failure  
CAP 034249; SW Pump B1 SW Backup Regulator Failed to Pickup  
CAP 034346; SW Pump B1 Seal Water Regulator Showing a Decreasing Pressure  
CAP 034387; Extent of Condition for SW Pumps A1, A2 and B2  
CAP 034340; Missed Opportunity to Prevent the A21 and B1 SW Pump Loss of  
Essential Gland Water  
OPR-152; SW Pump B1 Seal Water Pressure Regulator Pressure Indicator Showed a  
Decreasing Pressure Trend  
CAP 034356; SW and Fire System Kerotest Manifold and Root Isolation Valve Plugging  
Issues  
Control Room Log Records; May 30 - June 4, 2006  
GMP-270; ACC - Supplemental Cooling Fan Installation Should Service Water to Control  
Room Air Conditioning Fail; Revision A  
GMP-208; The Opening and Sealing of Penetration Seals; Revision K  
GNP-03.30.06A; Quarantine Guidelines; Revision A



KNPP Inservice Testing Basis Valve Data Sheet; Filtered Water to SW Pump Bearing Lube Water; Revision D  
 KPS Weld Data Sheet; June 7, 2006  
 KNPP Liquid Penetrant Examination Data Sheet; April 29, 2006  
 KNPP Visual Examination Record; S.W. from 24-Inch HDR to Diesel Generator 1B Cooling Water Heat Exchanger; April 30, 2006, May 2-3, 2006  
 RT-MI-87E; Equipment Operator Logs; May 23, 2006  
 CAP 034273; SW Header A Pressure Low Annunciator  
 CAP 034304; PI 11356 Used to Adjust SW-43A2 While WO 05-5036 Was Open  
 CAP 034349; Traveling Water Screen D/P High Alarm Received  
 N-SW-02; Service Water System; Revision AE  
 Drawing OPERM-394; Service Water Pre-Treatment System; Revision BS  
 Drawing OPERM-202-1; Service Water System  
 CAP 033366; Penetration 248 Not Properly Configured  
 CAP 033344; Penetrations Not Properly Sealed  
 Calculation/Evaluation C11078; Predict Auxiliary Building Mezzanine Area Temperature Following HELB in 633 Foot Elevation Assuming Boundary Penetration Area of 55 Square Inches  
 Drawings A-525-1, A-525-2; Steam Exclusion Boundary; Revision D  
 Drawing 237127A; Auxiliary Building - El 606 Feet; Reinforced Concrete Wall Plan  
 Drawing S-334; Auxiliary Building and Fuel Handling Area Reinforced Concrete Typical Details and Sections; Revision J  
 Drawing —1735-5; Sections and Details Sealing of Pipe and Cable Tray Penetrations for Concrete and/or Masonry Floors and Walls; Revisions C and D  
 Drawing —495; Sections and Details Sealing of Pipe Penetrations for Concrete and/or Masonry Floors and Walls; Revision M  
 Drawing —898; S.W. from 24-Inch HDR to Diesel Generator 1B Cooling Water Heat Exchanger; Revision D  
 NESML-Q-550; NES Materials Engineering Laboratory Materials Analysis Report; May 18, 2006  
 RCE 720; Kewaunee Power Station; Service Water to B Diesel Generator  
 SOP-SW-02-2B; Drain and Fill Train B Service Water Header; Revision A  
 WO 03-014214-000; 4-Inch Valve-Manual-Inlet at Diesel Generator 1B Heat Exchanger  
 WO 04-12458; Inspect and Clean Test Breaker 1-608, Service Water Pump Motor 1B1  
 WO 03-014282-000; 4-Inch Valve-Manual-Inlet at Diesel Generator 1B Heat Exchanger  
 WO 06-005626-000; Sample and Analyze for the Detection of Problem Causing Bacteria Involved with Microbiologically Influenced Corrosion in Accordance with Directions for Microbiologically Influenced Corrosion Kit 5 Test Kits  
 WO 06-005612-000; Plant System/Service Water  
 KPS System Leakage Test Record for Repair/Replacement Activities; Form  
 SP-55-324-1; Revision D

#### 1R19 Post-Maintenance Testing

CAP 018881; Radiography Determines Pitting Occurring in SW Supply to DG HXs  
 CEO 13897; Radiography Determines Pitting Occurring in SW Supply to DG HXs  
 CA 023207; Update CAP 018881 and CEO 13897 - Identified Work on B DG SW Piping Canceled  
 WO 03-014282-000; 4-Inch Valve-Manual-Inlet at Diesel Generator 1B Heat Exchange



Drawing —898; S.W. from 24-Inch HDR to Diesel Gen 1B Cooling Water Heat Exchanger; Revision D  
 WO 06-005626-000; Plant System/Service Water - Sample and Analyze Areas of Interest on SW Piping to the EDGs  
 GMP-208; The Opening and Sealing of Penetration Seals; Revision K  
 WO 06-005612-000; Plant System/Service Water - Replace 4-Inch Service Water Pipe Section Upstream of SW-300B  
 SOP-SW-02-28; Drain and Fill Train B Service Water Header; Original Revision  
 SOP-SW-02-28; Drain and Fill Train B Service Water Header; Revision A  
 CAP 033058; In Relay Rack 119 Four Boxes Did Not Have Proper Electrical Boundary Assignment  
 CAP 033059; In Relay Rack 120 Two boxes Did Not Have Proper Electrical Boundary Assignment  
 CEO 17533; In Relay Rack 119 Four Boxes Did Not Have Proper Electrical Boundary Assignment  
 PTE 94-0081; 4160V Circuit Breaker Parts; Revision 2  
 PTE 93-0031; Oils, Greases, and Lubricants; Revision 38  
 General Electric Instructions GEH-908M; Control and Instrument Switches; Types SB-1, SB-9, and SB-10  
 Kewaunee Power Station Special Inspection April 26, 2006 Event - List of Last Five Years of CAPs on Balance of Plant 4kV McGraw Edison Breakers; List of WOs Issued  
 CAP 033361; Maintenance for the 4160V Breakers and Cubicles Need Improvement  
 CAP 033815; 4kV Breaker Extent of Condition Recommendation  
 CAP 033277; Alert Declared after Trip of Feedwater Pumps Without Turbine/Reactor Trip

#### 1R20 Outage Activities

Dominion Reactor Trip Report; Kewaunee Power Station Reactor Trip - April 26, 2006  
 N-CRD-49B; Reactor Startup; Revision AK  
 N-TB-54; Turbine and Generator Operation; Revision BN  
 N-0-02; Plant Startup from Hot Shutdown to 35 Percent Power; Revision AT  
 N-CRD-49B; Reactor Startup; Revision AM  
 Shutdown Safety Assessment Checklists for the Duration of the Outage  
 N-0-02; Plant Startup from Hot Shutdown to 35 Percent Power; Revision AU  
 N-CVC-35A; Boron Concentration Control; Revision AH

#### 1R22 Surveillance Testing

CAP 032726; Clarification Needed Regarding EDG Fast Start Acceptance Criteria  
 SP-42-047B; Diesel Generator B Operational Test; Revision AE  
 SP-47-062A; Reactor Protection Logic Train A Test; Revision V  
 SP-47-062A Tracking and Processing Record; April 13, 2006  
 SP-47-062A; Reactor Protection Logic Train A Test; Revision T  
 SP-47-062A; Reactor Protection Logic Train A Test; Revision U  
 50.59 Applicability Review of SP-47-062A; Reactor Protection Logic Train A Test; April 12, 2006  
 SP-47-062B; Reactor Protection Logic Train B Test; Revision V  
 SP-34-099A; Train A RHR Pump and Valve Test - IST; Revision K

SP-34-099B; Train B RHR Pump and Valve Test - IST; Revision K  
 N-TB-54; Turbine and Generator Operation; Revision BO  
 SP-05B-283B; Motor Driven AFW Pump A Full Flow Test - IST; Revision M  
 SP-05B-283B Tracking and Processing Record; May 24, 2006  
 50.59 Applicability Review of SP-05B-283B; Motor Driven AFW Pump B Full Flow Test - IST; May 24, 2006  
 CAP 033366; Penetration 248 Not Properly Configured  
 CAP 033344; Penetrations Not Properly Sealed  
 Calculation/Evaluation C11078; Predict Auxiliary Building Mezzanine Area Temperature Following HELB in 633 Foot Elevation Assuming Boundary Penetration Area of 55 Square Inches  
 Drawings A-525-1, A-525-2; Steam Exclusion Boundary; Revision D  
 Drawing 237127A; Auxiliary Building - El. 606 Feet; Reinforced Concrete Wall Plan  
 Drawing S-334; Auxiliary Building and Fuel Handling Area Reinforced Concrete Typical Details and Sections; Revision J  
 Drawing M-1735-5; Sections and Details Sealing of Pipe and Cable Tray Penetrations for Concrete and/or Masonry Floors and Walls; Revisions C and D  
 Drawing M-495; Sections and Details Sealing of Pipe Penetrations for Concrete and/or Masonry Floors and Walls; Revision M

#### 1EP4 Emergency Action Level and Emergency Plan Changes

Kewaunee Power Station Emergency Plan; Revision 29  
 Emergency Plan Implementing Procedure AD-02; Revision AP

#### 1EP6 Drill Evaluation

Kewaunee Power Station Emergency Planning Drill Package; June 1, 2006

#### 2PS1 Radioactive Gaseous and Liquid Effluent Treatment and Monitoring Systems Program

2005 Annual Radioactive Effluent Release Report; dated April 28, 2006  
 2004 Annual Radioactive Effluent Release Report; dated April 12, 2005  
 2005 Annual Environmental Monitoring Report; dated April 28, 2006  
 2004 Annual Environmental Monitoring Report; dated April 26, 2005  
 Analytics, Inc. Radio-chemistry Cross Check Analyses; dated March 6, 2006  
 CAP 026254; Area TLDs Have Not Been Changed Out Per HP-03.010; dated March 16, 2005  
 CAP 026738; Turbine Building Sump Sludge; dated April 10, 2005  
 CAP 026820; Annunciator 47015-B 'Rad Monitor Power Supply Failure Received Unexpectedly; dated April 14, 2005  
 CAP 028801; High Dose Rate Alarm and Higher than Expected Dose Rates on Daily RCA Entry Review; dated August 11, 2005  
 CAP 029985; Vendor 106708 Does Not Implement 10 CFR 50 Appendix B; dated November 8, 2006  
 CAP 29921; R-6 Alarmed During Routine Reactor Coolant Sampling; dated November 3, 2005  
 CAP 029990; Vendor Provided Data May Have Been Duplicated in Effluent Software; dated November 11, 2005

CAP 030135 ODCM Has Not Been Updated and Maintained Current; dated November 16, 2005  
 CAP 030430; Waste Decay Tank Volume Calculation in RETS Code Does Not Account for Purge; dated December 7, 2005  
 CAP 030941; Check Source for R-25 to Weak to Show Indication When Installed in Field; dated January 17, 2006  
 CAP 031086; Conditionally Released Item Leaves Site; dated January 25, 2006  
 CAP 033340; NRC Question about R-18 and R-19 Calibration; dated April 28, 2006  
 RCE Maintenance Rule (a)(1) Evaluation - Radiation Monitoring; dated February 2, 2005  
 Environmental Inc. Midwest Laboratory; Interlaboratory Comparison Program Results; dated January - December 2005  
 Informal Self-Assessment Plan/Report; SA-7476; Radiological Effluents; dated 2005  
 Nuclear Oversight Observation Report 2004-002-2-020; Environmental Monitoring Program Assessment; dated June 28, 2004  
 Nuclear Oversight Observation Report 2005-004-2-005; ODCM/REMM; dated December 12, 2005  
 Offsite Dose Calculation Manual; Revisions 8 and 9  
 ODCM Listed Radiation Monitors Set Point Calculations and Discharge Permits; dated various  
 Radiological Environmental Monitoring Manual; Revision 9 and Associated 2005 Well Water Sample Results  
 Snap Shot Self-Assessment Report SA002048 (KSA-Chem-04-02); INPO03-004; Evaluation of Self-Identified Problems in Chemistry and Action Taken to Resolve Them; dated January 2004  
 Chemistry Procedure CHEM-00.003; Interlab Quality Control; Revision D  
 Chemistry Procedure CHEM-49.013; Sludge Sampling; Revision A  
 Chemistry Procedure CHEM-51.003-1 (Form); Gross Alpha and Gross Beta Data Sheet; Revision C  
 Chemistry Procedure CHEM-51.003-1 (Form); LLD Verification Data Sheet; Revision A  
 Chemistry Procedure CHEM-51.004 (Form); MCA Calibration Data Sheets  
 Health Physics Procedure HP-01.006, Attachment B; Quarterly LLD Verification; Revision J  
 Health Physics Procedure HP-05.004; Radiation and Contamination Survey and Airborne Radioactivity Sampling Schedules; Revision S  
 Health Physics Procedure HP-06.076; Instrument Operating Procedure - Multi-Channel Analyzer Systems; Revision E  
 Operating Procedure N-GWP-32B; Gaseous Waste Process and Discharge System; Revision AE  
 Operating Procedure N-LWP-32A-3; Waste Condensate Tanks and Pumps; Revision K  
 Surveillance Procedure SP-32-113; Gaseous Radioactive Effluent Reports for Continuous Releases; Revision N  
 Surveillance Procedure SP-32B-268; Site Boundary Doses from Gaseous Effluents; Revision H  
 Surveillance Procedure SP-45-050.11; RMS Channel R-11 Containment Particulate Radiation Monitor Calibration; Revision M  
 Surveillance Procedure SP-45-050.12; RMS Channel R-12 Containment Gas Radiation Monitor Calibration; Revision M  
 Surveillance Procedure SP-45-049.13; RMS Channel R-13 Auxiliary Building Ventilation Exhaust Train A Radiation Monitor Quarterly Functional Test; Revision Z

Surveillance Procedure SP-45-050.13; RMS Channel R-13 Auxiliary Building Ventilation Exhaust Train A Radiation Monitor Calibration; Revisions L and M  
 Surveillance Procedure SP-45-049.14; RMS Channel R-14 Auxiliary Building Ventilation Exhaust Train B Radiation Monitor Quarterly Functional Test; Revision AC  
 Surveillance Procedure SP-45-050.14; RMS Channel R-14 Auxiliary Building Ventilation Exhaust Train B Radiation Monitor Calibration; Revisions L and N  
 Surveillance Procedure SP-45-050.15; RMS Channel R-15 Condenser Air Ejector Gas Radiation Monitor Calibration; Revision T  
 Surveillance Procedure SP-45-049.16; RMS Channel R-16 Containment Fan Coil Unit Service Water Return Radiation Monitor Quarterly Functional Test; Revision P  
 Surveillance Procedure SP-45-050.16; RMS Channel R-16 Containment Fan Coil Unit Service Water Return Radiation Monitor Calibration; Revision N  
 Surveillance Procedure SP-45-049.18; RMS Channel R-18 Waste Discharge Liquid Radiation Monitor Quarterly Functional Test; Revisions N, O and P  
 Surveillance Procedure SP-45-050.18; RMS Channel R-18 Waste Discharge Liquid Radiation Monitor Calibration; Revisions P and R  
 Surveillance Procedure SP-45-049.19; RMS Channel R-19 Steam Generator Blowdown Sample Radiation Monitor Quarterly Functional Test; Revisions T and V  
 Surveillance Procedure SP-45-050.19; RMS Channel R-19 Steam Generator Blowdown Sample Radiation Monitor Calibration; Revisions O and Q  
 Surveillance Procedure SP-45-049.20; RMS Channel R-20 Auxiliary Building Service Water Return Radiation Monitor Quarterly Functional Test; Revision M  
 Surveillance Procedure SP-45-050.20; RMS Channel R-20 Auxiliary Building Service Water Return Radiation Monitor Calibration; Revisions K and M  
 Surveillance Procedure SP-45-049.21; RMS Channel R-21 Containment Stack Radiation Monitor Quarterly Functional Test; Revision U  
 Surveillance Procedure SP-45-050.21; RMS Channel R-21 Containment Ventilation Radiation Monitor Calibration; Revisions H, I and J  
 Surveillance Procedure SP-14-118A-1; Auxiliary Building Zone SV Train A Filter Laboratory Testing; Revision A  
 Surveillance Procedure SP-14-118B-1; Auxiliary Building Zone SV Train B Filter Laboratory Testing; Revision A  
 Surveillance Procedure SP-24-122A-1; Shield Building Vent Train A Filter Laboratory Testing; Revision A  
 Surveillance Procedure SP-24-122B-1; Shield Building Vent Train B Filter Laboratory Testing; Revision A  
 Surveillance Procedure SP-45-290; Radioactive Gaseous Effluent Monitoring Instrumentation, Compensatory Actions for Channels Out of Service; Revision D  
 USAR; Section 11; Revision 19

#### 4OA2 Identification and Resolution of Problems

Drawing XK-100-586; Rack No. RSC Layout; Revision 38  
 Drawing XK-100-553; Instrument Block Diagram Rod Control RR109 (RSC) Layout; Revision IN  
 Drawing E-1626; Main Steam and Steam Dump System; Revision V  
 Drawing XK-100-555; Steam Dump; Revision 2P  
 Drawing E-853; General Arrangement Relay Room; Revision AY  
 Drawing FA-11; Reactor Control System - Rack No. SD Layout; Revision 5A

Drawing FA-10; Reactor Control System - Rack No. RIL Layout; Revision 3C  
Drawing FA-15; Reactor Auxiliary System - Rack No. SA Layout; Revision 5  
Drawing XK-100-590; Rack RR105 (1PLPP) Layout; Revision 4C  
Drawing FA-18; Reactor Auxiliary System - Rack No. CVCSI Layout; Revision 5D  
Drawing XK-100-613; Rack No. CVCS2 Layout; Revision 3C  
Drawing XK100-594; Reactor Control system - Term, Block W/D Rack FW; Revision 4E  
Drawing XK-100-606; Reactor Auxiliary System - Rack No. RCS1 Layout (RR119);  
Revision 7K  
Drawing XK-100-602; Reactor Auxiliary System - Rack No. RCS2 Layout (RR120);  
Revision 3J  
Drawing E-2029; Chemical and Volume Control System; Revision V  
KNPP Asset Information Report; May 5, 2006  
WO 06-005628-000; Signal CNVTRA-BA Emergency Bypass Flow Signal Converter I/P  
WO 06-005514-000; Power Supply Reactor Coolant Loop B Bypass Flow PS  
Drawing E-2037; Reactor Coolant System; Revision AJ-1

## LIST OF ACRONYMS USED

ADAMS	Agencywide Documents Access and Management System
AFW	Auxiliary Feedwater
ANSI	American National Standards Institute
CAP	Corrective Action Program Document
CFR	Code of Federal Regulations
cpm	Counts Per Minute
CRAC	Control Room Air Conditioning
DG	Diesel Generator
DRP	Division of Reactor Projects
EDG	Emergency Diesel Generator
GNP	General Nuclear Procedure
HX	Heat Exchanger
IMC	Inspection Manual Chapter
IR	Inspection Report
KNPP	Kewaunee Nuclear Power Plant
kV	Kilovolt
LER	Licensee Event Report
NCV	Non-Cited Violation
NMC	Nuclear Management Company
NRC	U.S. Nuclear Regulatory Commission
ODCM	Offsite Dose Calculation Manual
OPR	Operability Recommendation
PARS	Publicly Available Records
PORC	Plant Operating Review Committee
QA	Quality Assurance
RA	Risk Assessment
Radwaste	Radioactive Waste
RCE	Root Cause Evaluation
RETS	Radiological Environmental Technical Specifications
RHR	Residual Heat Removal
SDP	Significance Determination Process
SW	Service Water
TDAFW	Turbine-Driven Auxiliary Feedwater
TS	Technical Specification
URI	Unresolved Item
USAR	Updated Safety Analysis Report
UT	Ultrasonic Testing
V	Volt
WGDT	Waste Gas Decay Tank
WO	Work Order