

August 13, 2009

Mr. David A. Heacock  
President and Chief Nuclear Officer  
Dominion Energy Kewaunee, Inc.  
Innsbrook Technical Center  
5000 Dominion Boulevard  
Glen Allen, VA 23060-6711

SUBJECT: KEWAUNEE POWER STATION  
SUPPLEMENTAL INSPECTION REPORT 05000305/2009503(DRS)

Dear Mr. Heacock:

On June 29, 2009, the U. S. Nuclear Regulatory Commission (NRC) completed a supplemental inspection pursuant to Inspection Procedure 95001, "Inspection for One or Two White Inputs in a Strategic Performance Area," at your Kewaunee Power Station. The enclosed inspection report documents the inspection results, which were discussed at the telephone exit conference on June 29, 2009, with Mr. M. Wilson and other members of your staff.

As required by the NRC Reactor Oversight Process Action Matrix, this supplemental inspection was conducted because a finding of White safety significance was identified in the third quarter of 2008. This issue was documented previously in NRC Inspection Report 050002008503, dated October 29, 2008, and involved emergency action level (EAL) threshold setpoints that were beyond the instruments capabilities to accurately measure and indicate for two Alert conditions. The NRC staff was informed on April 2, 2009, of your staff's readiness for this inspection.

The objectives of this supplemental inspection were to provide assurance that: (1) the root causes and the contributing causes for the risk-significant issues were understood; (2) the extent of condition and extent of cause of the issues were identified; and (3) corrective actions were or will be sufficient to address and preclude repetition of the root and contributing causes. The inspection consisted of examination of activities conducted under your license as they related to safety, compliance with the Commission's rules and regulations, and the conditions of your operating license.

The inspector determined that your staff performed an adequate evaluation of the White finding. Your staff's evaluation identified the primary root cause of the issue to be NAD 05.15, "Revision and Control of the Emergency Plan and Emergency Action Levels" did not contain sufficient guidance for development, validation, and approval of changes to emergency action level (EAL) setpoints. Your staff also identified that the EALs were not considered setpoints and therefore did not receive the rigor of setpoint changes and has taken corrective actions to ensure rigor has been added to the development phase of EAL changes in the revised NAD 05.15 and GNP-04.03.04, "Calculation - Preparation, Review, and Approval" procedures.

Based on the results of this supplemental inspection, no findings of significance were identified.

D. Heacock

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Sincerely,

*/RA/*

Hironori Peterson, Chief  
Operations Branch  
Division of Reactor Safety

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

Enclosure: Inspection Report 05000305/2009503  
w/Attachment: Supplemental Information

cc w/encl: S. Scace, Site Vice President  
M. Wilson, Director, Nuclear Safety and Licensing  
C. Funderburk, Director, Nuclear Licensing and  
Operations Support  
T. Breene, Manager, Nuclear Licensing  
L. Cuoco, Senior Counsel  
D. Zellner, Chairman, Town of Carlton  
J. Kitsemel, Public Service Commission of Wisconsin  
P. Schmidt, State Liaison Officer

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U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No: 50-305

License No: DPR-43

Report No: 05000305/2009503

Licensee: Dominion Energy Kewaunee, Inc.

Facility: Kewaunee Power Station

Location: Kewaunee, Wisconsin

Dates: June 1 through June 29, 2009

Inspectors: R. Jickling, Senior Emergency Preparedness Inspector

Approved by: H. Peterson, Chief  
Operations Branch  
Division of Reactor Safety

Enclosure

## SUMMARY OF FINDINGS

IR 05000305/2009503; 06/01/2009 - 06/29/2009; Kewaunee Power Station;  
Supplemental Inspection IP 95001.

This report covers a one month period of inspection conducted by one Region III emergency preparedness inspector. No findings of significance were identified. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process."

### **A. NRC-Identified and Self-Revealed Findings**

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

The NRC staff performed this supplemental inspection in accordance with IP 95001, "Inspection for One or Two White Inputs in a Strategic Performance Area," to assess the licensee's evaluation associated with the White finding for two Alert emergency action levels (EALs) which specified instrument setpoints that were beyond the limits of the effluent radiation monitors' capabilities to accurately measure and indicate, from August 24, 2006 through May 29, 2008. The NRC staff previously characterized this issue as having low to moderate safety significance (White), as documented in NRC Inspection Report 05000305/2008503. During this supplemental inspection, the inspectors determined that the licensee performed an adequate evaluation of the licensee-identified failure to maintain emergency plans which meet the standards in 10 CFR 50.47(b) and requirements in Appendix E to have a standard EAL scheme based on facility system and effluent parameters. The licensee identified the primary root cause of the issue to be poor procedural guidance in NAD 05.15, "Revision and Control of the Emergency Plan and Emergency Action Levels," and did not contain sufficient guidance for development, validation, and approval of changes to EAL setpoints which could have resulted in the inability to correctly identify and Alert emergency. The EAL setpoint issue was limited to the effluent radiation monitors specified in EALs RA1.1 and RA1.2, and the licensee has taken corrective actions to ensure all setpoints are valid for the equipment specified in the EALs. The licensee also implemented revisions to procedures NAD-05.15 and GNP-04.03.04, "Calculation - Preparation, Review, and Approval" to ensure changes to EAL setpoints are validated in the future.

Given the licensee's acceptable performance in addressing the EAL setpoints outside the operating range of the effluent radiation monitoring equipment, the White finding associated with this issue will only be considered in assessing plant performance for a total of four quarters in accordance with the guidance in IMC 0305, "Operating Reactor Assessment Program." Inspectors will review the licensee's implementation of corrective actions during a future inspection.

No violations of significance were identified.

### **B. Licensee-Identified Violations**

None.

## REPORT DETAILS

### 4. OTHER ACTIVITIES

#### 4OA4 Supplemental Inspection (95001)

##### .01 Inspection Scope

The NRC staff performed this supplemental inspection in accordance with IP 95001 to assess the licensee's evaluation of a White finding, which affected the emergency preparedness cornerstone in the reactor safety strategic performance area. The inspection objectives were to:

- provide assurance that the root and contributing causes of risk-significant issues were understood;
- provide assurance that the extent of condition and extent of cause of risk-significant issues were identified; and
- provide assurance that the licensee's corrective actions for risk-significant issues were or will be sufficient to address the root and contributing causes and to preclude repetition.

The Kewaunee Power Station (KPS) entered the Regulatory Response Column of the NRC's Action Matrix in the third quarter of 2008 as a result of one inspection finding of low to moderate safety significance (White). The finding was associated with threshold setpoints for two Alert emergency action levels (EALs) that were beyond the instrument capabilities to accurately measure and indicate. On August 26, 2006, KPS implemented a revised EAL scheme. The revised EALs included effluent radiation monitor setpoints for Alert emergency classifications that were outside of the operating range of the effluent radiation monitors.

Licenses are required to maintain a standard emergency classification and action level scheme, the bases which included facility system and effluent parameters, to be used by the licensee and which State and local response plans rely on information provided by the licensee for determination of minimum initial offsite response measures. As a result of having Alert EAL threshold values that were beyond the range of the associated effluent radiation monitors, Kewaunee personnel may not have been able to classify an emergency based upon an effluent radioactive material release in a timely manner. Emergency response actions directed by the State and local emergency response plans, which rely on information provided by the licensee, could have potentially been delayed.

The finding was characterized as having White safety significance based on the results of a Significance Determination evaluation performed by a region-based senior emergency preparedness inspector, as discussed in NRC inspection report (IR) 05000305/2008503. The EAL's threshold setpoints outside of the operating range of the effluent radiation monitors was attributed to insufficient guidance for development, validation, and approval of EAL setpoints in procedure NAD 05.15, "Revision and Control of the Emergency Plan and Emergency Action Levels." On May 29, 2008, KPS implemented a revision to the EALs with setpoints within the operating range of the effluent radiation monitors.

The licensee staff informed the NRC staff on April 2, 2009, that they were ready for the supplemental inspection. In preparation for the inspection, the licensee performed a root cause evaluation (RCE), RCE-2008-221, Revision 1, to identify weaknesses that existed in various organizations which allowed for a risk-significant finding and to determine the organizational attributes that resulted in the White finding.

The inspectors reviewed the licensee's RCE in addition to other evaluations conducted in support and as a result of the RCE. The inspectors reviewed corrective actions that were taken or planned to address the identified causes. The inspectors also held discussions with licensee personnel to ensure that the root and contributing causes and the contribution of safety culture components were understood and corrective actions taken or planned were appropriate to address the causes and preclude repetition.

## .02 Evaluation of the Inspection Requirements

### 02.01 Problem Identification

- a. Inspection Procedure 95001 requires that the inspection staff determine that the licensee's evaluation of the issue documents who identified the issue (i.e., licensee-identified, self-revealing, or NRC-identified) and the conditions under which the issue was identified.

The licensee identified the ability to read the initiating conditions (threshold setpoints) for EALs RU1.1, RA1.1 and RA1.2 on radiation monitors R-16, R-18, R-19, and R-20 was questionable for values above 1E+6 counts per minute (cpm) and that the radiation monitors R-19 and R-20 had been declared inoperable due to non-linear response above 1E+6 cpm. In addition, the licensee staff identified the non-linear response above 1E+6 cpm would impact the ability to classify an emergency under EALs RU1.2, RA1.1 and RA1.2 and the EAL threshold setpoints were based on limits which would be well beyond the linear range and in some cases beyond the range of the meters. This was identified in corrective action program (CAP) 039122, dated November 6, 2006. The inspectors verified that RCE-2008-221, dated May 2, 2008, identified that the EALs implemented on August 24, 2006, contained effluent radiation monitor setpoints for Alert classifications that were outside of the operating range of the effluent radiation monitors and that this could have resulted in the inability to correctly identify an Alert.

- b. Inspection Procedure 95001 requires that the inspection staff determine that the licensee's evaluation of the issue documents how long the issue existed and prior opportunities for identification.

The licensee's RCE documented that the EALs implemented on August 24, 2006, contained effluent radiation monitor setpoints for Alert classifications that were outside of the operating range of the effluent radiation monitors which were developed in October 2004 and then submitted to the NRC for approval. The licensee restored full compliance on May 29, 2008, when the revised EALs with onscale setpoints were implemented. The inspectors determined that the licensee's RCE was adequate with respect to identifying how long the issue existed and prior opportunities for identification.

- c. Inspection Procedure 95001 requires that the inspection staff determine that the licensee's evaluation documents the plant specific risk consequences, as applicable, and compliance concerns associated with the issue.

The NRC determined this issue was a White finding, as documented in IR 05000305/2008503, and the licensee's RCE also documented that the finding associated with this issue had safety significance of potentially not classifying some Alert conditions. The inspectors concluded that the licensee adequately documented the risk consequences and compliance concerns associated with the issue.

d. Findings

No findings of significance were identified.

02.02 Root Cause, Extent of Condition, and Extent of Cause Evaluation

- a. Inspection Procedure 95001 requires that the inspection staff determine that the licensee evaluated the issue using a systematic methodology to identify the root and contributing causes.

The licensee used the following systematic methods to complete RCE-2008-221:

- data gathering through interviews and document review;
- comparative timeline;
- why staircase; and
- barrier analysis.

The inspectors determined that the licensee evaluated the issue using a systematic methodology to identify root and contributing causes.

- b. Inspection Procedure 95001 requires that the inspection staff determine that the licensee's RCE was conducted to a level of detail commensurate with the significance of the issue.

The licensee's RCE included a comparative timeline, a barrier analysis, and a why staircase methodologies as discussed in the previous section. The licensee also evaluated causes, circumstances, error precursors, and failure modes for the following:

- EAL procedures;
- EAL development;
- EAL accuracy;
- EAL calculation;
- EAL validation; and
- EAL approval.

The licensee's RCE documented the root cause of the issue to be the station's procedure NAD 05.15, "Revision and Control of the Emergency Plan and Emergency Action Levels" did not contain sufficient guidance for development, validation, and approval of EAL setpoints. This resulted in a revision to the EALs to be implemented with Alert EAL threshold setpoints beyond the range of the effluent radiation monitors. The licensee determined that a contributing cause included EALs not being considered setpoints and not receiving the rigor that station setpoint changes received. Based on the work performed for this root cause evaluation, the inspectors concluded that the root cause evaluation was conducted to a level of detail commensurate with the significance of the problem.

- c. Inspection Procedure 95001 requires that the inspection staff determine that the licensee's RCE included a consideration of prior occurrences of the issue and knowledge of operating experiences (OE).

The licensee's RCE included an evaluation of internal and external OE. The licensee considered prior occurrences and OE. As a result of this review, the licensee determined that OE from an April 2004 RCE performed for problems at another plant identified a root cause of inadequate program management and process controls in place for the EP Department to revise the EALs. Changes and revisions were made to the EALs without adequate EP management consideration of the impact on the program or 10 CFR 54.54(q) requirements. Also, an August 10, 2005, CAP had been written for a similar condition at KPS where an EAL setpoints were offscale for the capabilities of the instrument. For external OE, one other station was identified as potentially having the same problem and another station identified that one of the values in its EAL technical basis document was offscale high. However, this OE was entered in the KPS corrective action process after discovery of the KPS offscale issue and would not have prevented the issue.

Based on the licensee's evaluation and conclusions, the inspectors determined that the licensee's RCE included a consideration of prior occurrences of the problem and knowledge of prior OE.

- d. Inspection Procedure 95001 requires that the inspection staff determine that the licensee's RCE addresses the extent of condition and extent of cause of the issue.

The licensee's evaluation considered the extent of condition associated with the EALs implemented on August 24, 2006, contained effluent radiation monitor setpoints for Alert Classifications that were outside of the operating range of the effluent radiation monitors which could have resulted in the inability to correctly identify an Alert classification. The licensee determined that the issue included all eight radiation monitors identified in the two Alert EALs. No other EAL setpoints were identified as outside of their instrument operating range and that there was no need to expand the extent of condition.

The licensee's evaluation also considered the extent of cause associated with procedure NAD 05.15, "Revision and Control of the Emergency Plan and Emergency Action Levels," not containing sufficient guidance for development, validation, and approval of EAL setpoints. The licensee staff determined that the three site programs reviewed (Fire Protection Plan, Security Plan, and the License Basis Document Change Process) had procedures that controlled changes made to each of the programs.

The inspectors concluded that the licensee's RCE addressed the extent of condition and the extent of cause of the issue.

- e. Inspection Procedure 95001 requires that the inspection staff determine that the licensee's root cause, extent of condition, and extent of cause evaluations appropriately considered the safety culture components as described in IMC 0305.

The licensee identified the 2004 RCE 645, "EALs Approval Process under Scrutiny," which indicated the extent of cause and condition may have been too narrowly focused and only looked at the 10 CFR 50.54(q) process. Also, had a causal evaluation been performed for CAP 28782, written August 2005, where a similar condition with an EAL setpoint off scale for the instrument, it may have resulted in earlier discovery and prevented submitting and implementing the changed EALs without validation. Additionally, the licensee identified there was a safety culture component pertaining to health and safety protection of the public by not validating all the EALs to show that changes made to the EALs could be implemented. Also, the licensee identified a component related to organization change management regarding the guidance in procedure NAD 05.15, "Revision and Control of the Emergency Plan and Emergency Action Levels," did not contain sufficient guidance for development, validation, and approval of EAL setpoints. The inspectors determined that the licensee's RCE included a proper consideration of whether a weakness in any safety culture component was a root cause or a significant contributing cause of the issue.

- f. Findings

No findings of significance were identified.

#### 02.03 Corrective Actions

- a. Inspection Procedure 95001 requires that the inspection staff determine that: (1) the licensee specified appropriate corrective actions for each root and/or contributing cause, or (2) an evaluation that states no actions are necessary is adequate.

The licensee took corrective actions to restore the EAL setpoints within the range of the monitors and implemented the revised setpoints on May 29, 2008. As compensatory actions for the offscale EAL setpoints, Chemistry samples were directed for event classification. To address the root cause and contributing cause the licensee revised procedure NAD 05.15 to add rigor to the development phase of EAL changes and added EAL calculations to GNP-04.03.04, "Calculation - Preparation, Review, and Approval." The inspectors determined that the corrective actions were adequate and addressed the root and contributing causes and identified to the licensee that Chemistry sampling may not have provided timely indication of emergency conditions.

- b. Inspection Procedure 95001 requires that the inspection staff determine that the licensee prioritized corrective actions with consideration of risk significance and regulatory compliance.

The licensee's corrective actions to address the root and contributing causes were appropriately prioritized. The inspectors determined that the corrective actions were prioritized with consideration of the risk significance and regulatory compliance.

- c. Inspection Procedure 95001 requires that the inspection staff determine that the licensee established a schedule for implementing and completing the corrective actions.

The licensee established appropriate due dates for the corrective actions that had not been completed as of the inspection end date and completion dates were identified for corrective actions completed. The inspectors determined that a schedule had been established for implementing and completing the corrective actions.

- d. Inspection Procedure 95001 requires that the inspection staff determine that the licensee developed quantitative and/or qualitative measures of success for determining the effectiveness of the corrective actions to preclude repetition.

As documented in RCE-2008-221, the licensee established measures for determining the effectiveness of the corrective actions. These measures included the following:

- revised NAD 05.15, "Revision and Control of the Emergency Plan and Emergency Action Levels" to add rigor to the development phase of EAL changes;
- revised GNP-04.03.04, "Calculation - Preparation, Review and Approval" to include EAL calculations required by NAD 05.15 ensuring EALs were considered as station setpoints to receive the rigor of setpoint changes;
- validated the complete set of values and setpoints in the EALs for availability, readability, ranges, scales, and units of measure;
- computer based training for 35 emergency response classification decision makers containing an overview of the offscale radiation monitors and Alert EALs issues; and
- monitoring the progress of EAL changes submitted to the NRC to bring the Alert setpoints back to scale.

The licensee staff entered these corrective action items into their CAP to ensure that these actions were monitored and completed. The inspectors determined that quantitative and qualitative measures of success had been developed for determining the effectiveness of the corrective actions to preclude repetition.

- e. Inspection Procedure 95001 requires that the inspection staff determine that the licensee's planned or taken corrective actions adequately address a Notice of Violation (NOV) that was the basis for the supplemental inspection, if applicable.

The NRC issued an NOV to the licensee on October 29, 2008. The licensee entered the apparent violation into the CAP as CR112022 on October 1, 2008. The CR112022 described: (1) corrective steps which have been taken and the results achieved; (2) corrective steps which will be taken; (3) the date when full compliance will be achieved; and (4) the reasons for the violation. During this inspection, the inspectors confirmed that the licensee's RCE had planned and taken corrective actions addressed the NOV. The licensee restored full compliance on May 29, 2008, when the revised EALs with the onscale setpoints were implemented.

f. Findings

No findings of significance were identified.

4OA6 Exit Meeting

.01 Exit Meeting Summary

On June 29, 2009, the inspectors presented the inspection results to Mr. M. Wilson, Director, Safety and Licensing by telephone conference and other members of your staff, who acknowledged the findings. The inspectors asked the licensee if any of the material examined during the inspection should be considered proprietary. The licensee did not identify any proprietary information.

.02 Regulatory Performance Meeting

On June 17, 2009, as part of the exit meeting associated with the 95001 inspection, the NRC met with the licensee to discuss their performance in accordance with Section 10.01.a of IMC 0305. During this meeting, the NRC and licensee discussed the issues related to Alert EALs offscale setpoints that resulted in the Kewaunee Power Station being placed in the Regulatory Response Column of the Action Matrix. This discussion included the causes, corrective actions, extent of condition, extent of cause, and other planned licensee actions.

ATTACHMENT: SUPPLEMENTAL INFORMATION

## **SUPPLEMENTAL INFORMATION**

### **KEY POINTS OF CONTACT**

#### Licensee

M. Wilson, Director, Nuclear Safety and Licensing

T. Breene, Licensing Manager

J. Egdorf, Emergency Preparedness Supervisor

J. Gadzala, Licensing

P. Serra, Nuclear Fleet Emergency Preparedness Manager, Innsbrook

#### Nuclear Regulatory Commission

S. Burton, Senior Resident Inspector

K. Barclay, Resident Inspector

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

#### Opened and Discussed

None

#### Closed

05000305/2008503-01    VIO    Failure to Maintain a Standard EAL Scheme

## LIST OF DOCUMENTS REVIEWED

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

### 4OA4 Supplemental Inspection

Kewaunee Power Station Emergency Plan; Emergency Action Levels; May 22, 2008

Kewaunee Power Station Emergency Plan; Emergency Action Levels; August 24, 2006

Kewaunee Power Station 2009 EAL Walkdown Guideline

Kewaunee Power Station 2007 EAL Simulator Walkdown Guideline

Kewaunee Power Station EAL Technical Bases Document

GNP-04.03.04; Calculation, Preparation, Review, and Approval

NAD 05.15; Development, Revision, and Control of Emergency Plan and EALs

RCE-2008-221; Evaluate EAL Setpoint Issues Root Cause

CR 112022; Failure to Maintain Standard EAL Scheme-Preliminary White Violation

CR 090741; Identified UE and Alert EAL Setpoint Issues with Plant Effluent Monitors

CR 028053; Brief Operating Crews when EALs Are Revised

CR 016298; EAL Table Alert Level Radiation Doesn't Fall within Range of Monitors

CA 028726; Evaluate EAL ICs Based on R-16/18/19 and 20

CA 026592; Non-Linear Response for R-18 and R-19 Detectors

CA 023010; Determine OE/Lessons Learned and Communicate to ERO

CA 019123; Track Implementation of EAL Calculation

CA 013471; Evaluate EAL Initiating Conditions Based on R-13, 14, 12 and 21

CE 018812; Non-Linear Response for R-18 and R-19 Detectors

CE 0176641; NRC Question about R-18 and R-19 Calibration

CAP 039122; Evaluate EAL ICs Based on R-16/18/19 and 20

CAP 037265; Non-Linear Response for R-18 and R-19 Detectors

CAP 033340; NRC Question about R-18 and R-19 Calibration

CAP 028782; EPIP-AD-02 EAL Chart A(2) Discrepancy

DCR 029923; Non-Linear Response for R-18 and R-19 Detectors

DCR 026981; Non-Linear Response for R-18 and R-19 Detectors

OTH 014874; R-18 is Out-of-Service for Liquid Rad Waste Discharge

## LIST OF ACRONYMS USED

ADAMS	NRC's Document System
AV	Apparent Violation
CAP	Corrective Action Program
cpm	counts per minute
CR	Condition Report
DRS	Division of Reactor Safety
EALs	Emergency Action Levels
EP	Emergency Preparedness
EPIP	Emergency Plan Implementing Procedure
ERO	Emergency Response Organization
GNP	General Nuclear Procedure
IMC	Inspection Manual Chapter
IP	Inspection Procedure
IR	Inspection Report
KPS	Kewaunee Power Station
NAD	Nuclear Administrative Directive
NEI	Nuclear Energy Institute
NOV	Notice of Violation
NRC	Nuclear Regulatory Commission
ODCM	Off-Site Dose Calculation Manual
OE	Operational Experience
PARS	Publicly Available Records
RCE	Root Cause Evaluation
SDP	Significance Determination Process
UE	Unusual Event
VIO	Violation