



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**

REGION III  
2443 WARRENVILLE ROAD, SUITE 210  
LISLE, IL 60532-4352

May 16, 2008

Mr. David A. Christian  
President and Chief Nuclear Officer  
Virginia Electric and Power Company  
Innsbrook Technical Center  
5000 Dominion Boulevard  
Glen Allen, VA 23060-6711

**SUBJECT: ERRATA TO KEWAUNEE POWER STATION - NRC INTEGRATED  
INSPECTION REPORT 05000305/2008002**

Dear Mr. Christian:

On May 14, 2008, the U.S. Nuclear Regulatory Commission (NRC) issued Integrated Inspection Report 05000305/2008002 for your Kewaunee Power Station. Inspection Report Section 4OA5.1, documenting the closure of Temporary Instruction (TI) 2515, "Pressurized Water Reactor Containment Sump Blockage," had portions of text inadvertently omitted. The enclosed errata contains the corrected pages and should replace those from the original report. Please remove pages 25 and 26 and insert revised pages 25 and 26 and additional pages 26a, 26b, and 26c, into Integrated Inspection Report 05000305/2008002.

Sincerely,

*/RA/*

Michael A. Kunowski, Chief  
Branch 5  
Division of Reactor Projects

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

Enclosure: Errata to Inspection Report 05000305/2008002

cc w/encl: S. Scace, Site Vice President  
T. Webb, Director, Nuclear Safety and  
Licensing  
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  
P. Schmidt, State Liaison Officer, State of Wisconsin

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Letter to D. Christian from M. Kunowski dated May 16, 2008

SUBJECT: ERRATA TO KEWAUNEE POWER STATION NRC INTEGRATED INSPECTION  
REPORT 05000305/2008002

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**ERRATA TO NRC INTEGRATED INSPECTION REPORT  
05000305/2008002**

4OA5 Other Activities

Pressurized Water Reactor Containment Sump Blockage (Temporary Instruction (TI) 2515/166)

.1 Closed NRC TI 2515/166, "Pressurized Water Reactor Containment Sump Blockage"

a. Inspection Scope

The inspectors reviewed the licensee's implementation of commitments documented in their September 1, 2005 (ADAMS Accession Number ML052500378) and February 29, 2008, (ADAMS Accession Number ML080650314) responses to Generic Letter (GL) 2004-02. The GL addresses Generic Safety Issue (GSI) 191, "Assessment Of Debris Accumulation On PWR Sump Performance." The inspectors reviewed licensee procedures, engineering design changes, and associated analyses. The inspection was conducted in accordance with TI 2515-166, "Pressurized Water Reactor Containment Sump Blockage."

b. Inspection Documentation

The questions posed by TI 2515/166 and associated status are outlined below:

- (1.) Question: Did the licensee implement the plant modifications and procedure changes committed to in their GL 2004-02 responses? List the commitments and the actions taken to meet each commitment. List when each action to meet each commitment was completed. State whether additional inspections are required to ensure all commitments have been met by the plant.

Unless otherwise noted, activities were completed either prior to or during the fall 2006 refueling outage with no additional inspection required to verify completion of commitments.

- Commitment: Perform modifications to containment sump.

The containment sump was modified under DCR3605, "Replacement of the ECCS Sump B Strainer." As part of the supporting analyses, the structural integrity was verified through performance of calculations PCI-5407-S01, "Structural Evaluation of Containment Sump," and PCI-5407-S02, "Evaluation of Sump cover and Piping for the Containment Sump Strainers." Inspection of the modified containment sump was documented in Inspection Report 05000305/2006005. Inspection of the engineering products, including the 10 CFR 50.59 safety evaluation, associated with the containment sump modification was documented in Inspection Report 05000305/2006016.

- Commitment: Perform walkdowns of containment and evaluate debris source term.

The results of containment walkdowns and the evaluation of the debris source term was documented by calculation 2004-08820, "GSI-191 Debris Generation." The debris source term was also evaluated through calculation ALION-REP-DOM-4458-02, "Kewaunee High Density Fiberglass Debris Erosion Testing Report."

- Commitment: Perform evaluation of strainer performance.

Strainer performance was evaluated in calculation TDI-6008-06, "Total Head Loss (ECCS Recirculation Strainer) – Kewaunee Power Station." Strainer flume testing was performed in February 2006 and June 2007. The results of these tests were documented by calculations 51-9014070, "Kewaunee Strainer Performance Test Report," and 51-9054883, "Kewaunee Containment Debris Trap Efficiency Test Report." The potential for vortexing and voiding was evaluated by TDI-6008-07, "Vortex, Air Ingestion and Void Fraction (ECCS Recirculation Strainer) – Kewaunee Power Station." At the time of this inspection, the strainer performance analysis was in the process of being updated to integrate results of June 2007 flume tests.

- Commitment: Perform evaluation of chemical effects.

Chemical effects were evaluated by calculation 51-9020502, "Chemical Precipitation Analysis for Kewaunee using WCAP-16530-NP." The calculation was updated in January 2008.

- Commitment: Perform evaluation of downstream effects.

Downstream effects were evaluated by calculations 2005-1400, "GSI-191 Downstream Effects – Flow Clearances," and 51-9017897, "Kewaunee RHR, SI [safety injection] and ICS [internal containment spray] Pump Evaluation for GSI-191 Downstream Effects." Downstream wear was evaluated by calculation 2005-13160, "Phase II Downstream Evaluation for Resolution of GSI-191." At the time of this inspection, these calculations were in the process of being updated to reflect changes to industry evaluation guidance.

- Commitment: Determine minimum available net positive suction head margin for the RHR pumps at switchover to sump recirculation.

Minimum available net positive suction head margin was determined as part of calculations supporting DCR3605. Submergence of the sump was verified by calculation 2006-01660, "Post LOCA Containment Flood Level (DCR 3605)." At the time of this inspection, calculation 2006-01660 was being updated.

- Commitment: Establish programmatic controls to ensure that potential sources of debris introduced into containment are assessed for adverse affects.

Overall GSI-191 programmatic controls were outlined in procedures CM-AA-CRS-10, "Containment Recirculation Sump GSI-191 Program," and CM-AA-CRS-100, "GSI Program Standards, Requirements, and Guidance for the Containment Recirculation Sump."

Procedures OP-KW-GOP-102, "Startup From Cold Shutdown to RHR," and OP-KW-GCL-102B, "Plant Requirements for Exceeding 200°F," required that the containment be inspected in accordance with procedure GNP-12.17.01, "Cold Shutdown Containment Inspection," when coming out of an outage. Procedure GNP-12.17.01 provided inspection guidance for ensuring the material condition of containment supported containment sump operability. For above cold shutdown conditions, procedure N-CCI-56, "Containment Access," in conjunction with procedure GNP-12.17.02, "Containment Inspection During Operations," provided guidance for ensuring non-permanent equipment and materials were not left in containment.

Procedure GMP-262, "General Insulation Information," provided guidance to minimize post-LOCA debris from insulation inside containment. Engineering specification ES-3000, "Specification for Insulation – General," specified that no aluminum be used in containment and that insulation within containment be jacketed. Engineering specification ES-3003, "Specification for Insulation – Nuclear Steam Supply System," also specified restrictions for insulation materials inside containment.

Procedures NAD-08.22, "Protective Coatings Program," and GNP-08.22.01, "Protective Coating Application for Service Level I Areas Inside the Reactor Containment Vessel," provided controls for applications of coatings within containment. Procedure CM-AA-CRS-103, "Containment Coating Condition Assessment" provided guidance for monitoring and assessing coatings within containment to ensure that the GSI-191 design basis was maintained.

Procedure MM-AA-102, "Foreign Material Exclusion," provided guidance on control for control of foreign material inside containment to prevent introduction of foreign material into the recirculation sump.

Latent debris was determined as part of calculation 2004-08820, "GSI-191 Debris Generation." Guidance for future latent debris sampling and assessment activities was described in procedures NEP-04.22, "Containment Latent Debris Sampling Evaluation," and NEP-04.23, "Containment Latent Debris Sample Collection." The licensee had established an initial latent debris sampling frequency of once every four cycles. The frequency was controlled through the licensee's preventive maintenance program in conjunction with an assessment of the frequency under procedure NEP-04.22.

Procedure FP-E-MOD-04, "Design Input Checklist (Part B – Design Considerations, Requirements, and Standards)" required consideration of whether containment sump recirculation performance or post-LOCA debris inventory would be affected by modifications.

Procedure GNP-01.31.01, "Plant Cleanliness and Storage," prohibited the storage of aluminum scaffolding materials in containment above cold shutdown.

During this inspection, the inspectors noted that several of the procedures used for implementation of GSI-191 programmatic controls were classified as non-safety related. Most notably, procedures GNP-12.17.01 and NEP-04.23 were classified as non-safety-related. The inspectors were concerned that the administrative controls for the procedures classified as non-safety-related may not be sufficient to ensure appropriate GSI-191 controls would continue to be maintained and implemented. The non-safety-related classifications appeared to be in conflict with the licensee's quality assurance program. Based on discussions, the inspectors learned that the licensee planned to revise their procedures program to treat the majority of plant procedures the same – i.e., the same controls for safety related procedures would apply to the majority of non-safety-related procedures. The licensee initiated corrective actions CR093709 and CA071163 in response to inspectors' concern.

- Commitment: Reduce post-accident debris source term.

Equipment labels which had the potential to become post-accident debris were removed from containment under corrective actions CA025943 and LBL024275. Jacketed fiberglass pipe insulation on the upper elevation of containment subjected to containment spray was replaced under work order KW06-003292. Jacketed calcium silicate insulation in the submergence zone was repaired to eliminate gaps in the jacketing to improve its material condition under work orders KW06-003290 and KW06-011598. In addition, fire proofing material for four beams was jacketed as part of modification DCR3605. The resident inspectors verified that the wooden reactor vessel O-ring storage container had been removed from containment.

- (2.) Question: Has the licensee updated its licensing bases to reflect the corrective actions taken in response to GL 2004-02? Licensing bases may not be updated until the licensee fully addresses GL 2004-02 (by December 31, 2007, unless an extension has been granted).

The licensee revised their USAR on April 19, 2007, to reflect modifications performed during their fall 2006 refueling outage. The USAR update also discussed what methodology was used for evaluating the modified sump design. However, during this inspection, the inspectors noted that the USAR update did not discuss programmatic controls put in place to ensure material inside containment was controlled. See Section 4OA2.1 for additional discussion of this issue.

- (3.) Question: If the licensee or plant has obtained an extension past the completion date of this TI, document what actions have been completed, what actions are outstanding, and close the TI for the plant that has the extension. Items not finished by the TI completion date can be inspected in the future using the generic refueling outage inspection procedure.

Physical modifications had been completed and programmatic controls had been put in place. At the time of this inspection, the licensee was in the process of updating analyses as follows:

- The strainer performance analysis was in the process of being updated to integrate results of the June 2007 flume tests. By letter dated November 15, 2007, (ADAMS Accession Number ML073190553), the licensee had requested an extension for updating this analysis. As discussed in a letter dated February 29, 2008, the licensee had scheduled this analysis to be updated by April 30, 2008.
- The licensee's downstream effects calculations were in the process of being updated to reflect changes to industry evaluation guidance (Westinghouse Pressurized Water Reactors Owner's Group WCAP-16406-P, "Evaluation of Long Term cooling Considering Particulate, Fibrous and Chemical Debris in Recirculation Fluid," Revision 1). By letter dated November 15, 2007, the licensee requested an extension for updating these analyses. As discussed in a letter dated February 29, 2008, the licensee had scheduled these analyses to be updated by May 31, 2008.
- The post-LOCA containment flood level analysis was being updated to reflect the guidance outlined in NRC letters dated August 15, 2007, (ADAMS Accession Number ML071060091) and November 21, 2007, (ADAMS Accession Numbers ML073110269 and ML0730278) to the Nuclear Energy Institute. The licensee had performed a preliminary analysis to support operability. As discussed in a letter dated February 29, 2008, the licensee had scheduled to update the analysis by May 31, 2008. The February 29, letter also provided a discussion of the preliminary analysis used to support operability. The inspectors considered the preliminary analysis sufficient to support operability and no further inspection is required.

This TI is closed for Kewaunee Power Station.

## .2 Quarterly Resident Inspector Observations of Security Personnel and Activities

### a. Inspection Scope

During the inspection period, the inspectors conducted the following observations of security force personnel and activities to ensure that the activities were consistent with licensee security procedures and regulatory requirements relating to nuclear plant security. These observations took place during both normal and off-normal plant working hours.

- Multiple tours of operations within the Central Security Alarm Stations;
- Tours of selected security officer response posts;
- Direct observation of personnel entry screening operations within the plant's Main Access Facility;
- Barrier/gate control activities; and
- Security force vehicle inspections.