



# ENERGY NORTHWEST

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GO2-08-107

**10 CFR 2.201**

U.S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, D.C. 20555-0001

**Subject: COLUMBIA GENERATING STATION, DOCKET NOS. 50-397, 72-035  
REPLY TO A NOTICE OF VIOLATION; EA-08-183**

**Reference:** Letter dated June 17, 2008, D. Blair Spitzberg (NRC) to JV Parrish (Energy Northwest): "Inspection Report Nos. 050-397/08-007; 072-035/08-001 and Notice of Violation"

Dear Sir or Madam:

Pursuant to 10 CFR 2.201, Energy Northwest hereby responds to the Notice of Violation transmitted via the reference above.

The attachment to this letter provides: (1) the reason for the violation; (2) the corrective steps that have been taken and the results achieved; (3) the corrective steps that will be taken to avoid further violations; and (4) the date when full compliance will be achieved.

There are no new commitments being made. If you have any questions, please contact MC Humphreys, Licensing Supervisor at (509) 377-4025.

Respectfully,

DK Atkinson  
Vice President, Nuclear Generation & Chief Nuclear Officer

Attachment

cc: EE Collins, Jr. – NRC RIV  
CF Lyon – NRC NRR  
NRC Senior Resident Inspector/988C

RN Sherman – BPA/1399  
WA Horin – Winston & Strawn  
Director, Spent Fuel Project Office

IED1  
IED8  
NRR

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### NOTICE OF VIOLATION EA-08-183

10 CFR 72.210 provides, in part, a general license for the storage of spent fuel in an independent spent fuel storage installation (ISFSI) at power reactor sites, to persons authorized to operate nuclear power reactors under 10 CFR Part 50. This general license is limited to storage of spent fuel in casks approved under the provisions of 10 CFR Part 72.

Certificate of Compliance (CoC) 1014, for the HI-STORM Cask System was issued in accordance with 10 CFR 72.238. The certificate states, in part, that it is conditional upon fulfilling the requirements of 10 CFR Part 72, as applicable, and the attached Appendix A (Technical Specification) and Appendix B (Approved Contents and Design Features).

Section 3.8 of CoC 1014, Appendix B, requires, in part, that during the Multi-Purpose Canister (MPC) lid-to-shell welding operations, combustible gas monitoring of the space under the MPC lid be performed to ensure that no combustible gas mixture is present in the welding area.

Contrary to the above, on April 8, 2008, and again on April 16, 2008 the licensee did not effectively monitor combustible gas concentrations under the MPC lid during the MPC lid-to-shell welding operations to ensure that no combustible gas mixture was present in the welding area. Specifically, on April 8, 2008, after the root pass of the lid-to-shell weld had been completed and work was being done on the next weld layer, the licensee elected to suspend combustible gas concentration monitoring; and on April 16, 2008, the position of the licensee's explosive gas monitor relative to the MPC vent port did not effectively detect combustible gas concentrations. Both of these situations resulted in hydrogen burn events.

### RESPONSE

Energy Northwest accepts this violation and provides the following response:

#### 1. Reason for the Violation

The cause analysis has identified two corresponding root causes, described below, that were associated with the failure to effectively monitor combustible gases during lid-to-shell welding on April 8, 2008 and April 16, 2008. The failure to effectively monitor was self evident as hydrogen burns occurred during the lid-to-shell welding operations on both dates. Corrective actions were taken following each event.

**Root Cause (April 8 Event):** Vague implementation of CoC Appendix B, Section 3.8, and FSAR requirements in the procedure (PPM 6.6.7, *MPC Processing*) permitted no gas exhausting and/or monitoring to occur in the field after the root pass of the welding was complete. This represents a latent weakness in administrative barriers. Existing work instructions (procedures) were inadequate to control hydrogen gas accumulation, as described below.

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- a. Procedure PPM 6.6.7, *MPC Processing*, preceding revision 19 (up to the April 8, 2008 event), contains wording in a critical step that can easily be read two ways, depending on the reader perspective. Lid welding step 7.2.3.1, which follows completion of the root weld pass and was an explicit step to monitor combustible gas during the root weld pass, stated:

“As directed by the Cask Loading Supervisor, secure the continuous exhaust and monitor in the proximity of the MPC lid vent port.”

To the author and procedure reviewers, the step directs to secure the exhauster and move the monitor from the proximity of the weld to the vent port to continue monitoring there. To the field workers and supervisors, the step directs to remove both the exhauster and the monitor (the monitor was monitoring the exhaust stream). Consequently, worker field practices for MPC processing during each campaign did not align with the intent of the author. The step quoted above should have been written as two separate steps to avoid ambiguity. With no monitoring, no intervention could take place in response to rising H<sub>2</sub> levels.

Procedure SWP-PRO-03, *Procedure Writers' Manual*, directs that the number of specific actions within an instructional step be limited to one unless the actions are functionally related and that the actions can be completed at the same time. The two actions in step 7.2.3.1 of PPM 6.6.7 did not meet both conditions described in SWP-PRO-03. This latent condition has existed from the original revision of PPM 6.6.7 which was issued prior to the first dry cask loading campaign in 2002.

- b. While the FSAR and CoC required monitoring and recommended exhausting (or purging) until the welding was complete, PPM 6.6.7, *MPC Processing*, did not contain any instruction as to how the chosen exhausting methodology was to be performed. The procedure merely restated a requirement to exhaust.

Procedure SWP-PRO-03, *Procedure Writers' Manual*, directs that the level of detail in procedures be commensurate with the skills and knowledge of the intended user and that the instruction content should be written for the intended user (not the seasoned user, Inspector, Auditor, Trainer, etc.). Venting/exhausting of the head space is a safety-related task that should not have been left to in-the-field determinations as to specifically how the task should be performed.

**Root Cause (April 16 Event):** Less than adequate review of immediate corrective actions. This represents a latent administrative barrier weakness in the corrective action program.

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Following the first event on April 8, it was recognized that combustible gas monitoring needed to be continued after the root pass weld of the MPC lid. Therefore, steps had been taken to reinstitute the method of combustible gas monitoring that was in effect prior to the root pass weld being complete. This method involved continuously exhausting the region under the MPC lid with a hose directed to a filter using the vent port on the MPC lid. However, once the root pass of the MPC lid to shell weld was fully in place, there was no means for fresh air to enter the area below the MPC lid other than through the MPC lid vent port, resulting in the inability to effectively monitor for combustible gases.

The immediate recovery plan following the first event failed to adequately evaluate the effectiveness of the proposed immediate corrective action to address the hydrogen burn problem. Although a problem was recognized, an incomplete problem definition focused the attention of the recovery team on fixing the procedure to comply with the CoC vs. explicitly defining how to prevent the hydrogen burn. It was assumed the former would take care of the latter. Although the procedure revision intended to incorporate the CoC requirement, it lacked sufficient detail to establish an effective means for avoiding a hydrogen burn.

### 2. Corrective Steps Taken and Results Achieved

#### Corrective Steps Taken

1. Suspended MPC welding pending investigation ("stop work" imposed following the April 16 event). The stop work was subsequently lifted following completion of action #3 below.
2. Performed procedure EGM-1-8, *Technical Issues Resolution Process*, to thoroughly analyze the events surrounding both hydrogen burn events and developed a recovery plan to address the ineffective monitoring.
3. Revised procedure PPM 6.6.7, *MPC Processing*, to require inert gas purge and continuous monitoring during welding, in accordance with the recovery plan outlined as a result of action #2 above.

#### Results Achieved

Effective combustible gas monitoring was achieved as determined during actual performance.

### 3. Corrective Steps to be Taken to Avoid Further Violation

1. Revise procedure PPM 6.6.7, *MPC Processing*, as follows to ensure lessons learned are clearly conveyed to the next campaign currently scheduled for 2014:
  - Add cautions to the body and attachment 9.2 regarding the concern for hydrogen gas ignition.

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- Incorporate lessons learned from inert gas purge during welding. Include details regarding purge flow, action limits, and response actions (e.g., increase purge flow).
  - Incorporate lessons learned regarding monitoring requirements during welding operations. This includes effective cask monitoring post root weld pass to ensure levels remain below the lower flammability limit (LFL).
2. Revise procedure SWP-IRP-03, *Incident Review Board* to include more detailed instruction regarding immediate/compensatory corrective action development and implementation associated with events warranting investigation.
  3. Issue a lesson learned bulletin to procedure writers using the PPM 6.6.7 example as an error prone condition to watch for.
  4. Review and revise PPM 6.6.x series procedures for compliance with SWP-PRO-03, *Procedure Writers Manual*, requirements, e.g., one action per step, etc.
  5. Perform a 100% review of HI-STORM FSAR and CoC requirements to PPM 6.6.x series procedure requirements.
  6. Revise applicable procedures (e.g., PPM 6.6.7, *MPC Processing*, PPM 6.6.9, *MPC Cooldown and Weld Removal System*) to include purging and monitoring requirements for MPC cutting activities.

#### 4. Date When Full Compliance Will be Achieved

Full compliance was achieved on April 25, 2008 when revision 20 to procedure PPM 6.6.7, *MPC Processing*, was approved and made effective. This revision included effective guidance to ensure compliance with CoC 1014, Appendix B, and Section 3.8. This new guidance was used in the completion of loading the remaining MPCs for the current loading campaign.