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Washington, DC 20555

Pursuant to the Washington State University Nuclear Radiation Center (WSU/NRC) Technical Specifications, section 6.10 (3) (d) (Reporting Requirements) a notice is due to the NRC within 30 days of "Any observed inadequacies in the implementation of administrative or procedural controls".

On Monday, July 30<sup>th</sup>, 2007, staff at the WSU/NRC removed three fuel bundles from reactor core 34A and transferred to storage racks within the pool, with accompanying tracking of fuel bundle identity and position. Fuel movement was performed as a preparatory step than is needed prior to removal and inspection of the transient pulse rod as described in WSU/NRC Standard Operating Procedure (SOP) 8, Standard Procedure for Control Element Maintenance, Removal, and Replacement. A description of requirements, given in Section B.1.b of SOP 8 states:

"The reactor shall be maintained subcritical by at least \$5.00 throughout the operation, without xenon, assuming that any experiment installed in the reactor may be removed."

Removal of three fuel bundles renders the core subcritical by at least \$5.00 with the transient pulse rod removed. Three fuel bundles were removed in accordance with SOP 7, Standard Procedure for Core Change and Fuel Movement. Following the fuel removal and verification of the minimum \$5.00 shutdown margin, the transient pulse rod was removed and inspected in accordance with SOP 8, Standard Procedure for Control Element Maintenance, Removal, and Replacement. After reinstallation of the transient pulse rod and verification of correct operation of the transient pulse rod system, the fuel bundles were replaced in the core in the same grid positions and same orientations that the bundles were in prior to removal. The reactor was subsequently returned to normal operations.

SOP 13, Reactor Power Calibrations, states:

“In addition, a reactor power calibration shall be performed immediately following any fuel movement into, out of, or between core positions other than the removal and reinstallation of a single fuel cluster, provided the same fuel cluster is returned to its identical position in the reactor core. The reactor shall not be operated at any power level for any reason other than calibration operations until the power calibration is completed.”

Prior to the reconfiguration to core 34A during September 2003, there was no need to remove more than a single fuel bundle to achieve the \$5.00 subcritical margin that is required to perform the transient pulse rod inspection. The change to core 34A from core 33X triggered the need to remove three fuel bundles to meet procedural requirements. SOP 13, Reactor Power Calibrations, was not updated at that time to integrate the changed requirement for fuel movement to carry out the procedures stipulated in SOP 8, Standard Procedure for Control Element Maintenance, Removal, and Replacement. Three fuel bundles have been removed from the core and subsequently replaced in their original grid positions during each of the last four transient pulse rod inspections in calendar years 2004, 2005, 2006 and 2007. Power calibrations were not performed after these fuel movements.

There is no indication that the reactor performance has been affected by the fuel movement that was performed as part of a requirement for transient pulse rod inspection. All subsequent routine power calibrations indicated normal core operational parameters. All other core parameters have indicated normal behavior subsequent to the transient pulse rod inspections.

In order to address this issue, SOP 13 (Reactor Power Calibrations) and SOP 7 (Core Changes and Fuel Movement) will be changed to more fully describe the power calibration requirements and to direct the staff to perform a power calibration after significant fuel movement.

The language of SOP 13 will be changed as follows:

**Current Text:**

A. General

Reactor power calibrations are required annually by Facility License R-76. In addition, a reactor power calibration shall be performed immediately following any fuel movement into, out of, or between core positions other than after the removal and reinstallation of a single fuel cluster, provided the same fuel cluster is returned to its identical position in the reactor core. Also a power calibration shall be performed after any replacement or alteration of individual or collective control elements. The reactor shall not be operated at any power level for any reason other than calibration operations until the power calibration is completed.

The reactor power calibration shall be performed after a minimum shutdown period of 60 hours.

Ensure that the NLW, NPP, and NMP-1000 channels are in calibration.

**Modified Text:**

A reactor power calibration shall be performed:

1. Annually, or as required by facility License R-76.
2. Immediately following any fuel movement into, out of, or between core positions other than the removal and reinstallation of a single fuel cluster, provided the fuel cluster is returned to its identical position in the reactor core. The removal and reinstallation of up to three fuel clusters, when removed in conjunction with a transient pulse rod inspection, shall not require the performance of a power calibration provided the fuel clusters are returned to their identical position(s) in the reactor core.

When a power calibration is required, the reactor shall not be operated at any power level for any reason other than calibration operations until the power calibration is completed.

The reactor power calibration shall be performed after a minimum shutdown period of 60 hours.

Ensure that the NLW, NPP, and NMP-1000 channels are in calibration.

This change will allow for the routine removal and inspection of the transient pulse rod without triggering a power calibration requirement, in accord with the original intent of the language contained in SOP 13, Reactor Power Calibrations.

SOP 7, Standard Procedure for Core Change and Fuel Movement, shall also be changed to be in accord with the changes in SOP 13, Reactor Power Calibrations. The current version of SOP 7, Section B, "Basic Requirements for Fuel Loading Changes" includes the following text:

**Current Text:**

Basic Requirements for Fuel Loading Changes

1. A complete Reactor Start-up Checkoff shall be performed on the reactor and associated instrumentation prior to fuel loading changes.
2. One Control Blade or Transient Rod shall be fully withdrawn from the core and all other control elements shall be fully inserted during actual fuel movement.
3. A licensed Reactor Operator shall be at the Reactor Control Console at all times during the operation.
4. The fuel moving operation shall be under the direct supervision of a Licensed Senior Operator.
5. A detailed running account of the operation including the fuel element cluster number shall be recorded in the Reactor Log.
6. Fuel element clusters shall be moved one at a time.
7. The neutron source shall be in the grid box.
8. During the transfer of irradiated fuel, the clusters shall be maintained under at least 10 feet of water at all times.
9. The fuel temperature as measured by the Instrumented Fuel Rod (IFR) shall not be more than 10 °C above the pool temperature. (NOTE: This allows reactivity measurements to be made at low power without having to correct for negative temperature coefficient contributions.)
10. When the operation is completed, file the approved written procedure in the Core Change Log binder.

Section B will have an additional point added, as item number eleven (11). Following is the additional text:

**Additional Text:**

11. After removing and reinstalling more than three fuel bundles from the core, a reactor power calibration shall be performed in accordance with the Reactor Power Calibrations procedure. The reactor shall not be operated at any power level for any reason other than calibration operations until the power calibration is completed.

The intent of the addition of item number 11 to the text for SOP 7, Standard Procedure for Core Changes and Fuel Movement, is to bring the need for a power calibration after significant fuel movement to the attention of the reactor staff. In addition to these changes, training will be held for all licensed staff and trainees to instruct them on the requirements of fuel movement, power calibrations and core operation.

If there are any questions, please contact me at the Washington State University Nuclear Radiation Center.

Respectfully Submitted,



Dr. Donald Wall, Director

Nuclear Radiation Center

Washington State University

Cc: Marvin Mendonca