



May 26, 2016
16-043

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

Reference: (1) License SNM-42, Docket 70-27
(2) Letter dated May 2, 2016, Eric C. Michel (NRC) to B.Joel Burch (BWXT NOG-L), NRC Integrated Inspection Report No. 07000027/2016002 and Notice of Violation.

Subject: Reply to a Notice of Violation in Inspection Report No. 07000027/2016002

Dear Sir or Madam:

Pursuant to the provisions of 10 CFR 2.201, BWXT Nuclear Operations Group, Inc.- Lynchburg, Va. (BWXT NOG-L), is providing a written response to the Notice of Violation (NOV) that was transmitted by the NRC letter dated May 2, 2016 (Reference 2). BWXT NOG-L's response to the Notice of Violation is provided in the attached enclosure.

If you have questions or require additional information, please contact Chris Terry, Manager of Licensing and Safety Analysis, at cterry@bwxt.com or 434-522-5202.

Sincerely,

A handwritten signature in black ink, appearing to read "B. Joel Burch", is written over a horizontal line.

B. Joel Burch
Vice President and General Manager
BWXT Nuclear Operations Group, Inc. – Lynchburg

Enclosure

cc: NRC, Region II
NRC, Resident Inspector
NRC, Merritt N. Baker, Senior Project Manager
Virginia Dept. of Health, Steve Harrison, Director

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NMSS

ENCLOSURE

REPLY TO NOTICE OF VIOLATION**Violation 70-27/2016-002-01**

Safety Condition S-1 of SNM License SNM-42, states, in part, "For use in accordance with the statements, representations, and conditions in Chapters 1 through 11 of the application submitted."

Chapter 11 of the BWXT license application, Management Measures, Section 11.4, Procedures, states, in part, that "Activities at BWXT NOG involving licensed material shall be conducted in accordance with written and approved procedures. Personnel shall be trained to perform all operations in strict compliance with procedures, Radiation Work Permits (RWP), or postings and not to perform an operation, utilizing licensed material, that is not addressed in a written and approved procedure, RWP, or posting."

Section I, Unloading Carriers and Boats, step 9.1 of Operating Procedure (OP) 0061556, Recovery Conversion Furnace Operation, Revision 13, states, in part, "ensure carrier holder with carrier has been moved to the carrier/boat unloading position."

Contrary to the above, on January 5, 2016, the licensee failed to ensure a carrier holder with carrier had been moved to the carrier/boat unloading position. Specifically, the failure to follow OP 0061556 resulted in an unplanned fire in the conversion furnace prefilter located in the direct cooling filter housing and the activation of the Emergency Operations Center (EOC).

The Reason for the Violation

Workstation (WS) 401 is a process furnace utilized for special nuclear material operations in the Recovery area. The fuel-bearing material is transferred through the furnace using a mechanical "push" mechanism to load fuel carriers into the furnace in series. A mechanical "pull" mechanism removes the fuel carriers from the furnace when the thermal treatment process is complete.

On January 5, 2016, the WS-401 furnace was started up for a routine production run. During the early stages of the WS-401 furnace run, the second unload cycle of an empty fuel carrier was not confirmed to be completed correctly which left an empty fuel carrier in the direct cooling section of the furnace. When the WS-401 operator initiated the third load cycle of a carrier with fuel, the clutch on the pusher kicked out due to there being too many carriers within the furnace and did not allow completion of the load cycle. The operator pressed the emergency stop for the system upon hearing the noise from the clutch and contacted the system engineer for troubleshooting assistance. The control system was designed to keep the furnace doors in their current state until a load cycle is completed to prevent damage to mechanical pushing and pulling components from the closing of the furnace doors. The initiation of the emergency stop during the incomplete loading cycle resulted in both furnace doors for the heating section and cooling section of the furnace remaining open. A resultant effect from this condition was exposure of the pre-filter within the cooling section ventilation to 665 °C air for an extended period of time. The pre-filter was rated for continuous use at 66 °C and caught on fire as a result of the exposure to the elevated temperature.

The TapRoot® investigation for the incident determined the root cause was an inadequate design specification for the pre-filter component. The upset condition of exposure to 665 °C air was not considered in the design specification for the furnace cooling section exhaust pre-filter. The pre-filter fire would have been prevented if the furnace cooling section pre-filter had been designed to withstand an upset condition with a prolonged exposure to 665°C air.

Also, the TapRoot® investigation team determined a contributing cause of the incident was a human performance error. The WS-401 operator did not verify that the fuel carrier had been removed from the furnace per OP-0061556. If the operator had stopped and verified the location of the fuel carrier on the unloading end of the furnace, the sequence of events that followed would not have occurred and WS-401 operations would have proceeded as normal.

The Corrective Steps Which Have Been Taken and the Results Achieved

1. Immediate Actions:

The following immediate actions were taken in response to the incident:

- An operator in the area obtained a portable fire extinguisher and quickly extinguished the fire on the external surface of the pre-filter following notification of the incident from the furnace operator.
- Personnel evacuated the Recovery area following smoke detector activation.
- The Emergency Management Organization assembled in the EOC and the NOG-L Emergency team was dispatched to the furnace area. The Emergency Team verified the fire was extinguished and had not spread downstream in the ventilation system utilizing a thermal imaging device.
- Furnace operations were verified to be in a safe shutdown mode and air sampling verified the airborne activity levels were well below internal action levels.
- A Level 1 Corrective Action (CA) was initiated and a Post Incident Review Team (PIRT) investigation team was established to review the event, develop a timeline of the incident, identify causal factors and recommend corrective actions to prevent recurrence.
- Operation of the furnace workstation was suspended until completion of the incident investigation and completion of management-required corrective actions necessary for restart.
- A Radiation Work Permit was generated to remove licensed material from the furnace. Removal of the material was completed under RWP-16-0010 on January 7, 2016.
- A Nuclear Work Model critique was conducted on January 7, 2016 with relevant personnel to gather timeline details pertinent to the PIRT investigation.

2. Long Term Corrective Actions Completed:

- OP-0061556 was revised to provide additional guidance to ensure a carrier has been removed from the cooling section of the furnace prior to starting a loading sequence.

Completed on: February 3, 2016

- An evaluation of appropriate pre-filter media was conducted to identify a pre-filter capable of withstanding temperatures in excess of 700 °C. A stainless steel wire mesh filter rated for continuous use at 750 °C and periodic exposure up to 1000 °C was identified and installed in the furnace ventilation system under Change Request (CR) 1045578.

Completed on: February 18, 2016

- A workplace meeting was conducted with area operators to discuss the TapRoot[®] investigation findings and corrective actions for the WS-401 event.

Completed on: February 24, 2016

- The furnace workstation programmable logic controller (PLC) logic was updated under CR 1045610 to use a sensor in the cooling section to verify if a carrier is located within the cooling section of the furnace. PLC programming was also updated to prevent the loading of a new carrier if a carrier is detected within the cooling section. The WS-401 furnace was released to operate following completion of this action.

Completed on: March 1, 2016

The Corrective Steps That Will Be Taken

- Quality Work Instruction 4.1.5 will be revised to provide additional guidance to ensure ventilation system conditions and material compatibility are considered in pre-filter selection.

To be completed by: June 14, 2016

Date When Full Compliance Will Be Achieved

Full compliance was achieved March 1, 2016.