November 14, 2007

Mr. Roger P. Cochrane, General Manager
BWX Technologies, Inc.
P.O. Box 785
Lynchburg, VA 24505-0785

SUBJECT: INSPECTION REPORT 70-27/2007-205 AND NOTICE OF VIOLATION

Dear Mr. Cochrane:

The U.S. Nuclear Regulatory Commission (NRC) conducted a routine announced nuclear criticality safety (NCS) inspection at your facility in Lynchburg, Virginia, from October 22 - 25, 2007. The purpose of the inspection was to determine whether activities involving special nuclear material were conducted safely and in accordance with NRC regulatory requirements. An exit meeting was held at the conclusion of the inspection on October 25, 2007. Throughout the inspection, observations were discussed with your managers and staff.

The inspection, which is described in the enclosure, focused on the most hazardous activities and plant conditions; the most important controls relied on for safety and their analytical basis; and the principal management measures for ensuring controls are capable, available, and reliable to perform their functions relied on for safety. The inspection consisted of analytical basis review, selective review of related procedures and records, examinations of relevant NCS-related equipment, interviews with NCS engineers and plant personnel, and facility walkdowns to observe plant conditions and activities related to safety basis assumptions and NCS controls.

Based on the results of this inspection, the NRC has determined that one Severity Level IV violation of NRC requirements occurred. The violation was evaluated in accordance with the NRC Enforcement Policy included on the NRC's web site at www.nrc.gov; select What We Do, Enforcement, then Enforcement Policy. The violation is being cited in the enclosed Notice of Violation (Notice), and the circumstances surrounding it are described in detail in the subject inspection report. The violation is being cited in the Notice because it was identified as a result of NRC inspection. The violation being cited as a Severity Level IV violation is the failure to comply with administrative limits for a glovebox.

You are required to respond to this letter and should follow the instructions specified in the enclosed Notice of Violation when preparing your response. The NRC will use your response, in part, to determine whether further enforcement action is necessary to ensure compliance with regulatory requirements.

In accordance with 10 CFR 2.390 of NRC's "Rules of Practice," a copy of this letter will be available electronically in the public electronic reading room of the NRC's Agency-Wide Document Access and Management System (ADAMS), accessible from the NRC Web site at http://www.nrc.gov/reading-rm/ADAMS.html.

If you have any questions concerning this report, please contact Thomas Marenchin, of my staff, at (301) 492-3209.

Sincerely,

/RA/

Deborah A. Jackson, Chief
Technical Support Branch
Division of Fuel Cycle Safety
and Safeguards, NMSS

Docket No.: 70-27
License No.: SNM-42

Enclosures:
1. Notice of Violation
2. Inspection Report 70-27/2007-205

cc: L. Morrell
Licensing Officer
BWX Technologies

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OFFICIAL RECORD COPY

BWX Technologies, Inc. Docket No.: 70-27
Lynchburg, VA License No. SNM-42

During an Nuclear Regulatory Commission (NRC) inspection from October 22 through October 25, 2007, a violation of NRC requirements was identified. In accordance with the NRC Enforcement Policy, the violation is listed below:

> Safety Condition No. S-1 of Special Nuclear Material License No. 42 requires that material be used in accordance with the statements, representations, and conditions in the license application dated July 14, 1995, and supplements thereto.
>
> Chapter 5.1.2 of the License Application states, in part, that activities at the site involving special nuclear material are conducted according to limits and controls established by Nuclear Criticality Safety (NCS). The administrative limits and controls are provided to the operating areas on nuclear criticality safety postings or in operating procedures or both.
>
> Contrary to the above, on October 22, 2007, the licensee failed to conduct operations according to administrative limits (e.g., quantity of containers and moderating materials) established by NCS and provided on an NCS posting. Specifically, a 2.5 liter container and a zip lock bag were observed in the Cyclone Glovebox, located in the Specialty Fuels Facility. The NCS posting on the Cyclone Glovebox limits the glovebox to a maximum of one container with a volume less than or equal to 2.5 liters and also limits the moderating materials permitted in the glovebox to only materials that are necessary for normal operations.

This is a Severity Level IV Violation (Supplement VI).

Pursuant to the provisions of 10 CFR 2.201, BWX Technologies, Inc. is hereby required to submit a written statement or explanation to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, D.C. 20555 with copies to the Chief, Technical Support Branch, Division of Fuel Cycle Safety and Safeguards, NMSS, and Regional Administrator, Region II, within 30 days of the date of the letter transmitting this Notice of Violation (Notice). This reply should be clearly marked as a “Reply to a Notice of Violation” and should include: (1) the reason for the violation, or, if contested, the basis for disputing 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. Your response may reference or include previously docketed correspondence if the correspondence adequately addresses the required response. If an adequate reply is not received within the time specified in this Notice, an Order or Demand for Information may be issued as to why the license should not be modified, suspended, or revoked, or why such other actions as may be proper should not be taken. Where good cause is shown, consideration will be given to extending the response time.

If you contest this enforcement action, you should also provide a copy of your response to the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555-0001.

Because your response will be made available electronically for public inspection in the NRC Public Document Room (PDR), or from the NRC's document system (ADAMS), accessible from the NRC web site at http://www.nrc.gov/reading-rm/adams.html, to the extent possible, it should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the public without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request withholding of such material, you must specifically identify the portions of your response that you seek to have withheld, and provide in detail the bases for your claim of withholding (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.790(b) to support a request for withholding confidential commercial or financial information). If safeguards information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21.

In accordance with 10 CFR 19.11, you may be required to post this Notice within two working days.

Dated this 14th **day of November 2007**

U. S. NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS

Docket No.:	70-27
License No.:	SNM-42
Report No.:	70-27/2007-205
Licensee:	BWX Technologies, Inc.
Location:	Lynchburg, VA
Inspection Dates:	October 22 - 25, 2007
Inspectors:	Thomas Marenchin, Criticality Safety Inspector Tamara Powell, Criticality Safety Inspector Kenneth Armstrong, Mechanical Engineer
Approved by:	Deborah A. Jackson, Chief Technical Support Branch Division of Fuel Cycle Safety and Safeguards, NMSS

Enclosure 2

EXECUTIVE SUMMARY

BWX Technologies, Inc.
NRC Inspection Report 70-27/2007-205

Introduction

Staff of the U.S. Nuclear Regulatory Commission (NRC) performed a routine and announced nuclear criticality safety (NCS) inspection of the BWX Technologies (BWXT), Lynchburg, Virginia facility from October 22 - 25, 2007. The inspection included an on-site review of the licensee NCS program, NCS training, NCS-related inspections, audits and investigations, plant operations and open item review. The inspection focused on risk-significant fissile material processing activities including fuel fabrication and machining, the uranium recovery area, the Research Test Reactor and Target area, the Specalty Fuels Facility (SFF), and the Lynchburg Technology Center.

Results

- A severity level IV violation was identified for the failure to comply with administrative limits for a glovebox.
- No safety concerns were identified regarding development, review, or approval of NCS analysis or calculations or resulting NCS controls.
- No safety concerns were identified regarding licensee-identified, NCS-related events and corrective actions.
- No safety concerns were identified regarding NCS audits.
- No safety concerns were identified regarding the licensee NCS training and qualification program.
- No safety concerns were noted regarding the re-designed high level dissolver in Uranium Recovery.

REPORT DETAILS

1.0 Summary of Plant Status

BWXT manufactures high-enriched uranium fuel, reactor core components and reactor cores at its facility near Lynchburg, VA. During the inspection, the licensee conducted routine fuel manufacturing operations and maintenance activities in the fuel fabrication and uranium recovery areas.

2.0 Nuclear Criticality Safety Program (IP 88015 & IP 88016)

a. Inspection Scope

The inspectors reviewed NCS analyses to determine that criticality safety of risk-significant operations was assured through engineered and human controls with adequate safety margin and preparation and review by qualified staff. The inspectors reviewed selected aspects of the following documents:

- OP-0061138, "Raschig Ring Installing, Removing, Replacing, and Washing Operation," Revision 22, dated June 25, 2007
- OP-0061265, "Control of Borosilicate Glass Raschig Rings," Revision 8, dated December 1, 2004
- NCS-2007-123, "NCS Analysis for Modification of the 2x5 and the 1x10 Element Pickling Fixture: SER [Safety Evaluation Report] 07-046 Phase 1," dated June 10, 2007
- NCS-2007-135, "NCS Analysis for RTTR U-Mo Dispersion Fuel Plate Fabrication: SER 07-0737 Phase 1," dated July 11, 2007
- NCS-2007-195, "Nuclear Criticality Safety Concern Analysis Addressing Solids in a Raschig Ring Filled Drum BWX_2017281," dated August 24, 2007
- NCS-2007-200, Nuclear Criticality Safety Analysis Supporting Clarified IROFS [item relied on for safety] for the UPRR General Purpose Area Organic Treatment Operation," dated September 4, 2007
- NCS-2007-220, "Nuclear Criticality Safety Release for VAFF Run 1 Development – Pack Area: SER 07-031 Phase 2," dated September 17, 2007
- NCS-2007-222, "Nuclear Criticality Safety Release Supporting CR-1026975, Modify Rack #2606 in Bay 5A," dated October 3, 2007
- NCS-2007-228, "NCS Analysis for Universal Element Pickle Fixture: SER 07-063 Phase 1," dated September 26, 2007
- NCS 2007-234, "NCS Analysis for VAFF Run 1 Development – Element Area: SER 07-031, Phase 3," dated September 26, 2007
- NCSE [nuclear criticality safety evaluation]-02, "Nuclear Criticality Safety Analyses and Quality Assurance Reviews," dated October 26, 2005

b. Observations and Findings

The inspectors reviewed NCS Approvals, nuclear criticality safety evaluation (NCSE), and supporting calculations for new, changed, and other selected operations. Within the selected aspects reviewed, the inspectors determined that the analyses were performed by qualified NCS engineers, that independent reviews of the evaluations were completed

by qualified NCS engineers, and that the analyses provided for subcriticality of the systems and operations. The inspectors observed that the analyses contained appropriate limits on controlled parameters for each credible accident sequence leading to inadvertent criticality. Nuclear criticality safety analyses and supporting calculations demonstrated adequate identification and control of NCS hazards to assure operations within subcritical limits.

c. Conclusions

No safety concerns were identified regarding development, review, or approval of NCS analysis or calculations or resulting NCS controls.

3.0 Nuclear Criticality Safety Event Review and Follow-Up (IP 88015 & IP 88016)

a. Inspection Scope

The inspectors reviewed the licensee response to internally reported events. The inspectors reviewed the progress of investigations and interviewed licensee staff regarding immediate and long-term corrective actions. The inspectors reviewed selected aspects of the following documents:

- NCS-2007-162, "NCS Concern Analysis Addressing the Loss of Acidity of Uranium Recovery Scrubber Solution," dated July 30, 2007
- NCS-2007-174, "NCS Concern for Exceeding the 400 grams U-235/Liter ROL Recovery Evaporator," dated August 7, 2007
- NCS-2007-160, "NCS Concern for Exceeding the 400 grams U-235/Liter ROL Recovery Evaporator," dated July 27, 2007
- NCS-2007-201, "30-Day Report to the General Manger: Recovery Tertiary Evaporator Concentration Limit Exceeded_BWX_2019186," dated September 5, 2007
- NCS-2007-232, "NCS Analysis for Tertiary Evaporator Steam Supply Interlock with Densitometer," dated October 9, 2007
- Quality Work Instruction 14.1.10, "Safety Evaluation of Unusual Incidents," Revision 8, dated February 15, 2007

b. Observations and Findings

On July 27, 2007 and August 7, 2007, during evaporation operations in Uranium Recovery, samples showed an over-concentration of the tertiary evaporator. The licensee evaluated the system and installed a densitometer with a higher concentration alarm to enhance the administrative controls. The inspectors noted that the safety significance of this internal event was low.

The inspectors determined that events were investigated in accordance with written procedures and appropriate corrective actions were assigned.

c. Conclusions

No safety concerns were noted regarding licensee identified NCS-related events and corrective actions were adequately tracked by the licensee.

4.0 Nuclear Criticality Safety Inspections, Audits, and Investigations (IP 88015)

a. Inspection Scope

The inspectors reviewed results of the most recent NCS quarterly audit to assure that appropriate issues were identified and resolved. The inspectors reviewed selected aspects of the following document:

- NCS-2007-164, "NCS Violation and Observation Summary – First Quarter 2007," dated May 1, 2007
- NCS-2007-164, "NCS Violation and Observation Summary – Second Quarter 2007," dated September 20, 2007
- NCSE-03, "Nuclear Criticality Safety Audits and Inspections," Revision 21, dated November 7, 2005

b. Observations and Findings

The inspectors determined that the licensee NCS audits were conducted in accordance with written procedures. The inspectors noted that the audits were performed by NCS engineers who reviewed open NCS issues from previous audits; reviewed new violations that occurred during the audit quarter; reviewed the adequacy of control implementation; reviewed plant operations for compliance with license requirements, procedures, and postings; examined equipment and operations to determine that past evaluations remained adequate; and analyzed non-compliances for potential trends.

c. Conclusions

No safety concerns were identified regarding NCS audits.

5.0 Nuclear Criticality Safety Training (IP 88015)

a. Scope

The inspectors reviewed the content of NCS training for general workers and for fissile material handlers. The inspectors evaluated the effectiveness of the licensee NCS training through interviews with both categories of workers and the licensee training management. The inspectors also reviewed the qualification requirements for NCS engineers. The inspectors reviewed selected aspects of the following documents:

- NCSE-07, "Qualification and Training Requirements for a Nuclear Criticality Safety Engineer," Revision 10, dated April 5, 2005
- Transcript of "Specialized NCS Training" video

b. Observations and Findings

The inspectors determined that employees complete a general NCS training course with an annual refresher. The inspectors noted that incoming NCS engineers have a series of requirements and tasks that must be completed before being considered a qualified NCS engineer., which are outlined in NCSE-07, "Qualification and Training Requirements for a Nuclear Criticality Safety Engineer."

The inspectors determined that the licensee NCS training program adequately addressed NCS aspects of facility hazards affecting fissile material operations. The inspectors also determined that only qualified staff performs safety functions for the establishment of new safety analyses and reviews of new operating procedures

c. Conclusions

No safety concerns were identified regarding the licensee NCS training and qualification program.

6.0 Review of Integrated Safety Analysis and Items Relied on For Safety (IROF) (IP 88016 & 88070)

a. Inspection Scope

The inspectors reviewed a recent permanent plant modification to determine the effectiveness of the configuration management system. The inspectors also reviewed the Integrated Safety Analysis (ISA) to determine that appropriate criticality safety accident sequences were identified and controlled consistent with approved criticality safety analysis. The inspectors reviewed selected aspects of the following documents:

- NCS-2004-284, "NCS Analysis Supporting Phase 2 of SER 04-012, 'HLD Redesign'," dated December 7, 2004
- NCS-2005-139, "NCS Analysis Supporting Revised Phase 2 of SER 04-012, 'HLD Redesign'," dated June 3, 2005
- NCS-2005-119, "Nuclear Safety Release for SER 04-012, Phase 2," dated June 16, 2005
- NCS-2004-290, "NCS Analysis Supporting Phase 3 of SER 04-012, 'HLD Redesign'," dated December 15, 2004
- SAR [Safety Analysis Report] 15.5, "High Level Dissolution Process in Uranium Recovery," Revision 65, dated October 12, 2006

b. Observations and Findings

The inspectors performed a walkdown of the re-designed High Level Dissolver (HLD) in Uranium Recovery and determined that items relied on for safety were adequately designed and implemented. The inspectors reviewed selected portions of the ISA related to the HLD and established that the accident sequences and controls corresponded with approved facility criticality safety analyses. The inspectors noted that the licensee's configuration management effectively identifies and resolves the effects of permanent plant modifications to IROFS and other safety controls.

c. Conclusions

No safety concerns were noted regarding the re-designed high level dissolver in Uranium Recovery.

7.0 Plant Operations (IP 88015)

a. Inspection Scope

The inspectors performed plant walkdowns to review activities in progress and to determine whether risk-significant fissile material operations were being conducted safely and in accordance with regulatory requirements. The inspectors interviewed operations staff and NCS engineers both before and during walkdowns. The inspectors reviewed selected aspects of the following documents prior to performing the walkdowns:

- OP-0061138, "Raschig Ring Installing, Removing, Replacing, and Washing Operation," Revision 22, dated June 25, 2007
- OP-0061265, "Control of Borosilicate Glass Raschig Rings," Revision 8, dated December 1, 2004

b. Observations and Findings

The inspectors verified that controls identified in NCS analyses were installed or implemented and were adequate to ensure safety. The inspectors also verified that safety was maintained for observed facility operations. The cognizant NCS engineers were knowledgeable and interacted regularly with operators on the process floors. The inspectors verified the adequacy of management measures for assuring the continued availability, reliability, and capability of safety-significant controls relied upon by the licensee for controlling criticality risks.

While conducting a walkdown of the SFF, the inspectors observed a 2.5 liter container and a zip lock bag in the Cyclone Glovebox. The NCS posting on the Cyclone Glovebox limits the glovebox to a maximum of one container with a volume less than or equal to 2.5 liters and also limits the moderating materials permitted in the glovebox to only materials that are necessary for normal operations. While interviewing operations staff and NCS engineers, the inspectors determined that the zip lock bag was not part of normal operations for the Cyclone Glovebox. Failure to conduct operations according to administrative limits (e.g., quantity of containers and moderating materials) outlined in the nuclear criticality safety posting is **Violation (VIO) 70-27/2007-203-01**.

c. Conclusions

A severity level IV violation was identified for the failure to comply with administrative limits for a glovebox.

8.0 Open Item Review

IFI 70-27/2007-203-01

This item tracks the licensee's corrective actions for the dropping of clad Special Nuclear Material (SNM) components into an acid tank, including a commitment to revise the ISA to correctly identify the IROFS for the acid tank. During a previous inspection, the inspectors observed that the accident sequences for the acid tank associated with May 24, 2007 event, EN-43389, that the licensee did not credit the operator following the operating procedure as an additional IROFS. The licensee committed to revise the ISA to correctly identify the IROFS for the acid tank operations. During this inspection, the inspectors determined that the licensee has updated the ISA to correctly identify the IROFS for the acid tanks. This item is closed.

9.0 Exit Meeting

The inspectors presented the inspection scope and results to members of the licensee's management and staff during an exit meeting on October 25, 2007. The licensee acknowledged and understood the findings as presented.

SUPPLEMENTARY INFORMATION

1.0 List of Items Opened, Closed, and Discussed

Items Opened

VIO 70-27/2007-205-01	Failure to conduct operations according to administrative limits (e.g., quantity of containers and moderating materials) outlined in the nuclear criticality safety posting

Items Closed

IFI 70-27/2007-203-01	Tracks the licensee's corrective actions for the dropping of clad SNM components into an acid tank, including a commitment to revise the ISA to correctly identify the IROFS for the acid tank.

2.0 Inspection Procedures Used

IP 88015	Nuclear Criticality Safety Program
IP 88016	Nuclear Criticality Safety Evaluations and Analyses
IP 88070	Permanent Plant Modifications

3.0 Partial List of Persons Contacted

BWXT

J. Creasey	Manager, Uranium Processing
D. Faidley	Nuclear Criticality Safety
J. Manning	Manager, Quality Control
B. Morcom	Manager, Assembly Operations
L. Morrell	Manager, Licensing and Safety Analysis
S. Nagley	Manager, Uranium Processing Operations
T. Nicks	Manager, Seecurity
S. Peters	Licensing Engineer
D. Ward	Manager, EHS&S
C. Yates	Nuclear Safety & Licensing

NRC

T. Marenchin	Criticality Safety Inspector, NRC HQ
T. Powell	Criticality Safety Inspector, NRC HQ
K. Armstrong	Mechanical Engineer
G. Wertz	Senior Resident Inspector, NRC Region II

Attachment

4.0 List of Acronyms

BWXT	BWX Technologies, Inc. (Licensee)
HLD	High Level Dissolution
IFI	inspector follow-up item
IP	inspection procedure
IROFS	item relied on for safety
ISA	integrated safety analysis
NCS	nuclear criticality safety
NCSE	nuclear criticality safety evaluation
NOV	Notice of Violation
SAR	Safety Analysis Report
SER	Safety Evaluation Report
SFF	Specialty Fuels Facility
SNM	Special Nuclear Material
VIO	violation