



UNITED STATES
NUCLEAR REGULATORY COMMISSION

REGION II
SAM NUNN ATLANTA FEDERAL CENTER
61 FORSYTH STREET SW SUITE 23T85
ATLANTA, GEORGIA 30303-8931

[REDACTED]

February 7, 2005

BWX Technologies, Inc.
ATTN: Mr. W. D. Nash, Vice President
and General Manager
Nuclear Products Division
P. O. Box 785
Lynchburg, VA 24505-0785

SUBJECT: NRC INSPECTION REPORT NO. 70-27/2005-001 AND NOTICE OF VIOLATION

Dear Mr. Nash:

This refers to the inspection conducted from November 28, 2004 through January 8, 2005, at the Nuclear Products Division facility. The purpose of the inspection was to determine whether activities authorized by the license were conducted safely and in accordance with NRC requirements. At the conclusion of the inspection, the findings were discussed with those members of your staff identified in the enclosed report.

Areas examined during the inspection were: Plant Operations, Management Organization and Controls, Maintenance and Surveillance, Radiation Protection, Material Control and Accounting, and Physical Protection. Within these areas, the inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observation of activities in progress.

Based on the results of this inspection, the NRC has determined a violation of NRC requirements occurred. The violation is cited in enclosed Notice of Violation (Notice) and the circumstances surrounding it are described in detail in the subject inspection report. An additional violation was identified and treated as a non-cited violation (NCV), consistent with Section VI.A.8 of the Enforcement Policy. If you contest these violations or their significance, you should provide a response within 30 days of the date of this inspection report, with the

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[REDACTED]

[REDACTED]

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2

basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with copies to the Regional Administrator, Region II, and the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001, and the NRC Senior Resident Inspector at your facility.

You are required to respond to this letter and should follow the instructions specified in the Notice 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.

[REDACTED]

[REDACTED] Should you have any questions concerning this letter, please contact us.

Sincerely,

/RA/

David A. Ayres, Chief
Fuel Facility Inspection Branch 1
Division of Fuel Facility Inspection

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

Enclosures: 1. Notice of Violation
2. NRC Inspection Report

cc w/encls:
Leah R. Morrell
Manager, Licensing and Safety Analysis
BWX Technologies
P. O. Box 785
Lynchburg, VA 24505-0785

Distribution w/encls: (See page 3)

[REDACTED]



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Distribution w/encls:

- D. Ayres, RII
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- B. Westreich, NSIR

*see previous concurrence

PUBLIC DOCUMENT (circle one): NO

OFFICE	RII:DFFI	RII:DFFI	RII:DFFI	
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NAME	*GWertz	*SCaudill	*Classifier	
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NOTICE OF VIOLATION

BWX Technologies, Inc.
Lynchburg, Virginia

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

During an NRC inspection conducted on November 28, 2004 through January 8, 2005, a violation of NRC requirements was identified. In accordance with the "General Statement of Policy and Procedures for NRC Enforcement Actions," NUREG-1600, the violation is listed below:

Safety Condition S-1 of NRC license SNM-42 authorizes the use of nuclear materials in accordance with Chapter 1-8 of the License Application submitted on July 14, 1995, and supplements thereto.

Section 2.7 of the License Application states that activities involving licensed materials shall be performed in accordance with written and approved procedures.

Operating Procedure 100116 prohibits scrap material containers containing more than [REDACTED] from placement in the scrap material storage cabinet.

Contrary to the above, an operator failed to comply with the procedure requirement and, on December 8, [REDACTED] containers exceeding the [REDACTED] limit were found in the [REDACTED]. The condition resulted in the loss of a nuclear criticality safety control and an Item Relied On For Safety.

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, DC 20555 with a copy to the 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 or severity level, (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 a Demand for Information may be issued as to why the license not be modified, suspended, or revoked, or why such other action as may be proper should 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, with the basis for your denial, to the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001.

[REDACTED]

Enclosure 1

NOV

2

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

Dated this 7th day of February, 2005

[REDACTED]

U. S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.: 70-27

License No.: SNM-42

Report No.: 70-27/2005-001

Licensee: BWX Technologies, Inc.

Facility: Nuclear Products Division

Location: Lynchburg, Virginia

Dates: November 28, 2004 through January 8, 2005

Inspector: G. Wertz, Senior Resident Inspector
S. Caudill, Senior Fuel Facility Inspector

Approved by: David A. Ayres, Chief
Fuel Facilities Inspection Branch 1
Division of Fuel Facility Inspection

[REDACTED]

[REDACTED]

NRC INSPECTION REPORT 70-27/2005-01

EXECUTIVE SUMMARY

BWX Technologies, Inc., Nuclear Products Division

This inspection included periodic observations conducted by the senior resident inspector during normal and off-normal shifts in the area of Plant Operations, Management Organization and Controls, Maintenance and Surveillance, Radiation Protection, Material Control and Accounting, and Physical Protection. A specialized inspection was conducted by a regional inspector in the area of Material Control and Accounting (December 13 through 17).

Plant Operations

- The facility was generally operated safely and in accordance with regulatory and license requirements. The Emergency Operations Center and associated equipment were maintained in a state of readiness. Maintenance work was performed in accordance with radiation work permit requirements. Housekeeping was adequate to ensure routes of egress were clear in case of an emergency (Paragraph 2.a).
- Nuclear criticality safety control devices and measures were generally being properly implemented. However, a violation of NRC requirements was identified related to operator placement of special nuclear material containers in an unauthorized storage cabinet. Although the condition resulted in the loss of a nuclear criticality safety (NCS) control and an Item Relied On For Safety, other controls were effective to ensure a criticality accident remained highly unlikely (Paragraph 2.b).

Management Organization and Controls

- An external review of the fire system provided the licensee with recommendations to prevent an over-pressurization of the piping system and identified minor deficiencies in the suppression capability of a non-special nuclear material storage area. Compensatory measures implemented were adequate while the staff evaluated permanent resolution. The analyses' recommendations were reviewed by licensee management and tracked in the licensee's corrective action program. Overall fire suppression capability remained effective (Paragraph 3.a).
- The licensee appropriately corrected an incomplete component test [REDACTED] verification process by entering the annual test requirement into a tracking system. An extent of condition review included other [REDACTED] tests (Paragraph 3.b).

Maintenance and Surveillance

- Relocation [REDACTED]
[REDACTED] was performed effectively (Paragraph 4).
- [REDACTED]

[REDACTED]

Radiation Protection

- The licensee performed effective and comprehensive radiological surveys and analysis of asphalt prior to excavation and removal in order to verify background radiation levels and ensure an absence of licensed radiological contaminants (Paragraph 5).

Material Control and Accounting

- [REDACTED]
- [REDACTED]
- [REDACTED]

Physical Protection

- [REDACTED]

Attachment:

- Partial Listing of Persons Contacted
- List of Items Opened, Closed and Discussed
- Inspection Procedures Used
- List of Acronyms

[REDACTED]

[REDACTED]

REPORT DETAILS

1. **Summary of Plant Status**

a. **Routine Operations**

Routine fuel manufacturing operations and maintenance activities were conducted in the [REDACTED] process areas, and in the [REDACTED] facility. [REDACTED] and other routine operations and maintenance activities were conducted in the Uranium Recovery (UR) facility.

Special nuclear material (SNM) processing [REDACTED] manufacturing operations ceased for the Holiday period on December 24, 2004, and resumed on January 2, 2005.

b. **Management and Organizational Changes**

On January 4, the Site Vice President and Plant General Manager announced several management and organizational changes, effective January 15, to the staff. The Administration (Human Resources) and Security Department was separated into two departments, the Administration Department and the Security Department. Both positions report to the Site Vice President. The changes were intended to provide additional focus to the security and human resource areas. Other changes announced included new personnel in the positions of Operations Manager; Engineering Manager; and Quality Control Manager.

2. **Plant Operations (Temporary Instruction (TI) 2600/006)**

a. **Conduct of Operations - Routine Observations**

(1) **Inspection Scope and Observations**

The inspector observed various operational activities to determine if the facility was operated safely and in accordance with license and regulatory requirements. The inspector verified that the Emergency Operations Center (EOC) was maintained in a state of readiness. The inspector reviewed various operational procedures and records, radiation work permits (RWP), and nuclear criticality safety (NCS) postings and observed that specific operations were performed safely and in accordance with approved plant procedures and postings. Outside areas were toured and no conditions that could create an undesirable situation or hazard in the event of adverse weather (high winds, cold weather, or flooding), or blocked evacuation pathways were observed. The inspector observed that equipment and devices used to contain radioactive contamination and airborne radioactivity in [REDACTED] processing, UR, and other [REDACTED] areas [REDACTED] were in proper working condition, and that personal protective clothing and dosimetry were issued and properly worn. The inspector noted that emergency egress routes were adequately clear of debris. Housekeeping was sufficient and no significant hazards were identified. A routine fire safety tour verified that fire hazards were minimized especially in locations containing hazardous chemicals or [REDACTED] SNM.

[REDACTED]

[REDACTED]

(2) Conclusions

The facility was generally operated safely and in accordance with regulatory and license requirements. The EOC and associated equipment were maintained in a state of readiness. Maintenance work was performed in accordance with RWP requirements. Housekeeping was adequate to ensure routes of egress were clear in case of an emergency.

b. Implementation of Process Safety Controls

(1) Inspection Scope and Observations

The inspector reviewed nuclear criticality control devices and measures in effect during the inspection period in order to assess the effectiveness of the licensee's program for prevention of an inadvertent criticality. The inspector toured [REDACTED] processing, storage, and recovery areas and observed that personnel generally complied with approved, written NCS limits and controls, especially in areas where the licensee was using administrative controls rather than passive or active engineering controls. The inspector verified NCS limits were posted and available to the operators. During tours of both [REDACTED] areas of the facility, the inspector observed spacing practices and controls, use of storage locations, and identification of SNM.

On December 8, the inspector reviewed various [REDACTED] manufacturing area used to process [REDACTED]. The inspector questioned area management who were unsure of the labels' meaning. The following day, the inspector questioned the area operator who indicated that [REDACTED].

The inspector observed the [REDACTED] NCS posting [REDACTED]. However, a handwritten sign indicated that the containers should be surveyed [REDACTED]. [REDACTED]

The inspector reviewed the SNM process with the area manager and observed that the containers were surveyed prior to their transport to the storage cabinet in the compaction area. A review of the operator's compaction survey log indicated multiple instances where compacted material [REDACTED] exceeded the [REDACTED] limit. The inspector concluded that the pre-compaction surveys were not effective to prevent material containers with [REDACTED] from entering the compaction process. In addition, the OP required the containers to be labeled [REDACTED].

[REDACTED]

These issues were captured in corrective action (CA) 2004-869 and the licensee planned additional cause determination and corrective actions.

NCS controls were reviewed with the cognizant NCS engineer who performed NCS Analysis 2004-292 in order to evaluate

. As a result of the failed IROFS, the licensee surveyed all containers in the cabinet and identified two additional unauthorized containers. However, the . The inspector verified other IROFS identified in the SAR remained effective to ensure a criticality accident remained highly unlikely.

SNM-42 License Condition 2.7 requires activities involving SNM to be performed in accordance with written and approved procedures.

Failure to adhere to the requirements of the OP resulted in unauthorized containers in a storage cabinet and the failure of an NCS control and IROFS. This condition represented a violation of NRC requirements and was cited as Violation (VIO) 70-27/2005-01-01, Failure to Comply with Procedure Requirements for SNM Storage.

(2) Conclusions

NCS control devices and measures were generally being properly implemented. However, a violation of NRC requirements was identified related to operator placement of SNM containers in an unauthorized storage cabinet. Although the condition resulted in the loss of an NCS control and an Item Relied On For Safety, other controls were effective to ensure a criticality accident remained highly unlikely.

3. Management Organization and Controls (TI 2600/006)

a. Third Party Review of the Fire System

(1) Inspection Scope and Observations

The licensee initiated a third party (external) safety review and analysis of the fire system as a result of an over-pressurization event on January 27, 2004, (for additional information, see NRC Inspection Report 70-27/2004-004). The inspector discussed the analyses with the fire safety engineer and reviewed the associated CA commitments.

The third party review was comprised of three evaluations: "Fire System Piping Analysis," "Sprinkler System and Water Supply Analysis for the High Rise Storage Area," and "Fire Pumps Controllers." Hydraulic flow test data indicated that the fire system piping was in satisfactory condition. Some anomalous data indicated an unknown source of water to hydrants, but no impairment to the fire system. The fire system for the area (containing non-SNM material) was found

to have [REDACTED] capacity. Compensatory measures were implemented which included removal of all excess combustible material and manual initiation of the fire pumps upon receipt of an area flow alarm (sprinkler activation). The inspector toured the area with the fire system engineer and concluded that the compensatory measures were adequate. Additional review of fire system changes necessary to address the issue was planned and tracked by CA 2004-545-06. Overall, the inspector concluded that the fire system remained effective to support fire suppression.

Other recommendations from the analysis included:

- 1) a fire pump starting logic change to prevent dual pump starts on loss of electrical power and preclude undesirable pressure surges;
- 2) incorporation of fire system valves into the maintenance program; and
- 3) improved accuracy in the fire system drawings.

The external analyses had been reviewed by licensee management and the recommendations were captured in the licensee's CA program.

(2) Conclusions

An external review of the fire system provided the licensee with recommendations to [REDACTED]. Compensatory measures implemented were adequate while the staff evaluated permanent resolution. The analyses' recommendations were reviewed by licensee management and tracked in the licensee's CA program. Overall fire suppression capability remained effective.

b. Corrective Action Review

(1) Inspection Scope and Observations

An NCS audit identified that an annual verification of test [REDACTED] used to place [REDACTED] components into a [REDACTED] test [REDACTED] had not been completed. The purpose of the verification was to ensure that the various test [REDACTED] used were maintained properly and would limit the [REDACTED] test [REDACTED] to [REDACTED] SNM [REDACTED] component concurrently. The verification was one of several NCS controls designed to prevent an inadvertent criticality and was considered an IROFS as described in SAR table 15.37.4.1.1.

The area supervisor indicated that the verification requirement was specified in OP 1009331. However, no tracking method had been established to ensure test performance. As a result, the verification had not been performed since initial operation of the system in 2002. CA 2004-872 committed to incorporating the verification requirement into the departmental action tracking system. In addition, other [REDACTED] test

[REDACTED] verification requirements were reviewed. The inspector observed the [REDACTED] test process with the cognizant operator and noted that independent verification of proper test [REDACTED] use was performed and documented as required by the NCS posting. No safety concerns were identified as a result of the missed verification and licensee's root cause and corrective actions appeared appropriate.

(2) Conclusions

The licensee appropriately corrected an incomplete component test [REDACTED] verification process by entering the annual test requirement into a tracking system. An extent of condition review included other [REDACTED] tests.

4. **Maintenance and Surveillance (TI 2600/006)**

a. Inspection Scope and Observations

Relocation of the [REDACTED] to the [REDACTED] was performed and tested on December 16, 2004. The inspector reviewed the work as described in Safety Evaluation Requests 04-002 and 04-008, Phases 04B1b and 02B1b, respectively. The inspector reviewed the relocated alarms with [REDACTED] operators who indicated functional testing had been properly completed and the system worked as described. No discrepancies were observed.

b. Conclusions

Relocation of the [REDACTED] was performed effectively.

5. **Radiation Protection (TI 2600/006)**

a. Inspection Scope and Observations

Asphalt excavation was performed within the controlled access area in November 2004. The inspector reviewed the results of the radiological surveys and analysis in order to assess the effectiveness of the licensee's contamination control program. Core samples of the asphalt were obtained in June 2004 for the planned excavation area. Isotopic analysis of the samples indicated background radiation levels and no contamination of the asphalt. The inspector toured the excavated area and reviewed the sample locations noting that the most likely areas for contamination had been sampled. The inspector concluded that the licensee effectively and comprehensively evaluated the asphalt for possible radiological contamination prior to excavation.

[REDACTED]

b. Conclusions

The licensee performed effective and comprehensive radiological surveys and analysis of asphalt prior to excavation and removal in order to verify background radiation levels and ensure an absence of licensed radiological contaminants.

6. Material Control and Accounting (TI 2600/006)

a. Routine Inspection

(1) Inspection Scope and Observations

[REDACTED]

[REDACTED]

(2) Conclusions

[REDACTED]

b. [REDACTED]

(1) Inspection Scope and Observations

[REDACTED]

(2) Conclusions

[REDACTED]

[REDACTED]

[REDACTED]

c. [REDACTED]

(1) Inspection Scope and Observations

[REDACTED]

[REDACTED]

(2) Conclusions

[REDACTED]

7. Physical Protection (TI 2600/006)

a. Inspection Scope and Observations

[REDACTED]

b. Conclusions

[REDACTED]

[REDACTED]

8. **Followup on Previously Identified Issues**

a. [REDACTED] **Failure**

As a result of an inadvertent [REDACTED], the licensee planned to replace [REDACTED]. NCS inspectors from NRC Headquarters reviewed the licensee's NCS analysis and proposed replacement plan. The inspectors concluded that the licensee's detector replacement plan would provide adequate coverage in the event of an inadvertent criticality accident and documented their review in NRC Inspection Report 70-27/2004-207. As such, NCV 70-27/2004-05-01 was closed.

9. **Exit Meeting**

The inspection scope and results were summarized on January 14, 2005, with T. Brown, Operations Manager, acting for W. Nash, Vice President and General Manager, and other members of the licensee's staff. Proprietary documents and processes were reviewed during this inspection and this report has been appropriately marked as such. No dissenting comments were received from the licensee.

[REDACTED]

ATTACHMENT

1. **LIST OF PERSONS CONTACTED**

Licensee

- T. Brown, Manager, Engineering
- C. Carr, Manager, Administration
- R. Coats, Manager, Environmental Protection
- R. Cochrane, Manager, Operations
- J. Compher, Manager, Industrial Engineering
- J. Creasey, Manager, Uranium Processing
- L. Duncan, Manager, Nuclear Criticality Safety
- R. Hogg, Manager, Downblending Operations
- T. Martin, Manager, Security Operations
- F. Metz, Manager, RTRT Operations
- L. Morrell, Manager, Licensing & Safety Analysis
- W. Nash, Vice President and General Manager
- T. Nicks, Manager, Security
- J. Noel, Manager, NRC Security
- S. Peters, Manager, Recovery Operations
- C. Reed, Manager, Uranium Processing
- S. Schilthelm, Manager, Safety and Licensing
- D. Spangler, Manager, Radiation Protection
- M. Suwala, Manager, Nuclear Materials Control
- D. Ward, Manager, Environment, Safety, Health and Safeguards

Other licensee employees contacted included engineers, technicians, production staff, security, and office personnel.

2. **LIST OF ITEMS OPENED AND CLOSED**

<u>Item Number</u>	<u>Status</u>	<u>Description</u>
70-27/2005-01-01	Opened	VIO - Failure to Adhere to Procedure Requirements for Storage of SNM (Paragraph 3.c)
70-27/2005-01-02	Opened	[REDACTED]
70-27/2004-08-01	Closed	[REDACTED]
70-27/2005-01-03	Opened/Closed	[REDACTED]

70-27/2004-05-01 Closed

NCV - Failure to Maintain the [REDACTED]

[REDACTED] (Paragraph 8.a)

3. **INSPECTION PROCEDURES USED**

TI 2600/006 Resident Inspection Program for Category I Fuel Cycle Facilities

4. **LIST OF ACRONYMS USED**

CA	Corrective Action
CAS	Central Alarm Station
CMS	Criticality Monitoring System
EOC	Emergency Operations Center
FNMCP	Fundamental Nuclear Material Control Plan
IFI	Inspector Followup Item
IROFS	Item Relied On For Safety
LTC	Lynchburg Technology Center
MAA	Material Access Area
NCS	Nuclear Criticality Safety
NCV	Non-cited Violation
OP	Operating Procedure
PA	Protected Area
PPP	Physical Protection Plan
RTRT	Research Test Reactor and Targets
RWP	Radiation Work Permit
SAR	Safety Analysis Report
SAS	Secondary Alarm Station
SNM	Special Nuclear Material
TI	Temporary Instruction
TP	Treatment Plant
VIO	Violation
UR	Uranium Recovery
URI	Unresolved Item
U-235	Uranium 235
WT	Waste Treatment