



UNITED STATES
NUCLEAR REGULATORY COMMISSION

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

[REDACTED]

[REDACTED]

October 29, 2004

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. 70-27/2004-007

Dear Mr. Nash:

This refers to the inspection conducted from September 5 through October 16, 2004, 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 are identified in the report. 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 that a violation of NRC requirements occurred. This violation is being treated as a non-cited violation (NCV), consistent with Section VI.A.8 of the Enforcement Policy. The NCV is described in the subject

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

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inspection report. If you contest the violation or significance of this NCV, you should provide a response within 30 days of the date of this inspection report, with the 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 Resident Inspector at your facility.

[REDACTED]

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

Sincerely,

/RA/ D. Collins for
David A. Ayres, Chief
Fuel Facility Inspection Branch 1
Division of Fuel Facility Inspection

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

Enclosures: 1. NRC Inspection Report (Part 1) [REDACTED]
2. NRC Inspection Report (Part 2) [REDACTED]

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]

[REDACTED]



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U. S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.: 70-27

License No.: SNM-42

Report No.: 70-27/2004-007

Licensee: BWX Technologies, Inc.

Facility: Nuclear Products Division

Location: Lynchburg, Virginia

Dates: September 5 through October 16, 2004

Inspector: G. Wertz, Senior Resident Inspector

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

[REDACTED]

Enclosure 1

[REDACTED]

[REDACTED]

[REDACTED]

NRC INSPECTION REPORT 70-27/2004-07 (PART 1)

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 facility operations. The results of these inspections are included in Part 1 of this report.

Plant Operations

- The facility was 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 properly implemented (Paragraph 2.b).
- Special nuclear material operations in the [REDACTED] were performed in accordance with procedure requirements. Nuclear criticality safety and radiation protection controls were effectively maintained (Paragraph 2.c).

Management Organization and Controls

- Nuclear criticality safety and radiation protection programs were reviewed by the Safety Review Committee in accordance with license application requirements. No significant safety concerns were identified (Paragraph 3.a).
- A non-cited violation was identified when a special nuclear material [REDACTED] was placed in a storage location prohibited by the nuclear criticality safety posting. The safety significance of the issue was low since double contingency was maintained by other nuclear criticality safety controls. Corrective actions included retraining the operators and implementation of a computer-based [REDACTED] system. (Paragraph 3.b).

[REDACTED]

[REDACTED]

Radiation Protection

- Radioactive material from Industrial Waste Landfill Number 1 was excavated safely and in accordance with applicable procedures. Radioactive material and contamination control practices were effective. Following excavation, NRC contractors independently obtained soil samples for confirmatory radioactive material analysis. Laboratory results were pending at the conclusion of the inspection period (Paragraph 4).

Emergency Preparedness

- The Emergency Operations Center was activated and properly responded to a severe weather (tornado) warning on September 17. Special nuclear material was secured and personnel were sheltered (Paragraph 5.a).
- The quarterly Emergency Preparedness drill effectively exercised Emergency Operations Center personnel and demonstrated adequacy of the Alternate Emergency Operations Center (Paragraph 5.b).

Transportation

- Contaminated soil from Industrial Waste Landfill Number 1 was properly loaded for transport to a disposal facility. The shipping manifest accurately described the shipment (Paragraph 6).

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

Routine fuel manufacturing operations and maintenance activities were conducted in the [REDACTED] Facility. Uranium recovery, downblending and other routine operations and maintenance activities were conducted in the [REDACTED] Facility.

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 Emergency Operations Center (EOC) was maintained in a state of readiness. Operating procedures (OPs) and records, radiation work permits (RWPs), and nuclear criticality safety (NCS) postings were reviewed by the inspector. Selected operations and maintenance observed by the inspector were performed safely and in accordance with approved OPs, RWPs, and postings.

Outside areas were toured to ensure there were no conditions with a potential hazard in the event of high winds or flooding, and to ensure that evacuation pathways were not obstructed. Equipment and devices used to contain radioactive contamination and airborne radioactivity in fuel processing, UR, and other material access areas (MAAs) were in proper working condition, and personal protective clothing and dosimetry were used properly. Housekeeping was sufficient that no significant hazards were identified. During a routine fire safety tour, the inspector verified that potential fire hazards were minimized in locations containing hazardous chemicals or [REDACTED] special nuclear material (SNM).

(2) Conclusions

The facility was operated safely and in accordance with regulatory and license requirements. The EOC and associated equipment were maintained in a state of readiness. Housekeeping was adequate to minimize fire hazards and to ensure exit routes were clear in case of an emergency.

[REDACTED]

[REDACTED]

b. Implementation of Process Safety Controls

(1) Inspection Scope and Observations

Nuclear criticality control devices and measures were reviewed to assess the effectiveness of the licensee's NCS program for prevention of an inadvertent criticality. The inspector toured fuel processing, storage, and recovery areas and observed that personnel 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 [REDACTED] areas, the inspector observed appropriate SNM spacing practices and controls, proper use of storage locations, and correct identification of SNM.

(2) Conclusions

NCS control devices and measures were properly implemented.

c. [REDACTED] Operations

(1) Inspection Scope and Observations

SNM operations in the [REDACTED] were observed by the inspector. Operators were cognizant of, and observed processing SNM in accordance with, the applicable OP requirements. NCS and radiation protection (RP) controls, including SNM mass and moderation limits, glove box ventilation and fire detection systems, were maintained in accordance with the requirements of the NCS postings and Safety Analysis Report (SAR) 15.33, [REDACTED]

(2) Conclusions

SNM Operations in the [REDACTED] were performed in accordance with procedure requirements. NCS and radiation protection controls were maintained.

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

a. Safety Review Committee

(1) Inspection Scope and Observations

The inspector attended the Safety Review Committee (SRC) meeting held on October 5. SRC members reviewed the NCS and RP programs in accordance with the requirements of License Application Section 2.3.4. The SRC discussed corrective action (CA) and safety program effectiveness, as well as more recent safety topics including the severe weather evacuation and NCS training workshops. The number and

significance of the safety findings were comparable to previous meetings. No significant safety concerns were identified.

(2) Conclusions

NCS and RP programs were reviewed by the SRC in accordance with license requirements. No significant safety concerns were identified.

b. Corrective Action Review of Inadequate SNM Control

(1) Inspection Scope and Observations

CA-2004-543 documented the licensee's discovery of an SNM [REDACTED] found in an incorrect storage [REDACTED] location. The NCS posting required the [REDACTED] to be stored [REDACTED]. However, the [REDACTED] was found on an upper level location, which was a violation of the NCS posting and NRC requirements. An investigation team determined that the root causes were an unclear [REDACTED] description on the routing card and subsequent failure by the operator to fully ascertain [REDACTED] prior to storage. CA involved implementation of a computer-based [REDACTED] system as the primary means to identify the [REDACTED] and storage location rather than the operator. The inspector observed the computer-based system with the responsible area supervisor and concluded that the corrective action was adequate to prevent recurrence. Operators were also retrained on information verification concepts and NCS posting requirements.

NCS engineers calculated that the misplaced [REDACTED] caused a minor increase in the analyzed k-effective of approximately 0.5 percent. The inspector reviewed SAR table 15.37.4.1.1 and concluded that double contingency had been maintained and that the risk of an inadvertent criticality accident remained highly unlikely. As such, this non-repetitive, licensee-identified and corrected violation was treated as a non-cited violation (NCV), consistent with Section VI.A.8 of the NRC Enforcement Policy (NCV 70-27/2004-07-01, SNM [REDACTED] Stored in Violation of NCS Posting Requirements).

(2) Conclusions

An NCV was identified when an SNM [REDACTED] was placed in a storage location prohibited by the NCS posting. The safety significance of the issue was low since double contingency was maintained by other NCS controls. Corrective actions included operator retraining and implementation of a computer-based [REDACTED] system.

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

a. **Excavation and Sampling of Industrial Waste Landfill Number 1**

Excavation work to remove radioactive contaminated soil from Industrial Waste Landfill (IWL) Number 1 began in June and was completed in late September. The inspector observed work area preparation and soil removal activities. The work was done in accordance with interim change commitment 5054, "Final Status Sampling for IWL #1," to RP-08-20, "Soil Sampling Procedure," and RWP 2004-110. Effective radiological contamination control practices were observed for workers and equipment entering the excavated area. Calibrated survey instruments were used correctly by workers exiting the controlled area. Equipment removed from the excavation area was properly decontaminated. The inspector observed effective project oversight by the licensee and contract project managers. Daily pre-job briefs performed by the contract project manager reinforced worker safety and radiological control expectations.

Two minor radiological control discrepancies were identified by the inspector and promptly corrected by the licensee. However, one of the discrepancies was not entered into the CA system. The inspector discussed the issue with the safety and licensing manager and CA-2004-756 was initiated.

The inspector coordinated and observed soil sampling activities by NRC contractors from the Oak Ridge Institute for Science and Education (ORISE) on October 11 and 12, 2004. Sampling was done in order to provide independent analysis and confirmation of complete removal of radioactive material from the IWL. Twenty soil samples from the excavation area were obtained for laboratory analysis by the ORISE technicians. Three of the samples were collected from areas excavated approximately two feet below the IWL in order to evaluate any potential contaminate migration. Tamperproofing and chain of custody controls appeared effective as the samples were shipped by the licensee to ORISE. Final survey results were pending at the close of this inspection report period.

b. **Conclusions**

Radioactive material from IWL Number 1 was excavated safely and in accordance with applicable procedures. Radioactive material and contamination control practices were effective. Following excavation, NRC contractors independently obtained soil samples for confirmatory radioactive material removal analysis. Laboratory results were pending at the conclusion of the inspection period.

5. **Emergency Preparedness (TI 2600/006)**

a. **EOC Response to Severe Weather Conditions**

(1) **Inspection Scope and Observations**

The EOC was activated at 2:00 p.m. on September 17 in response to severe weather warnings issued by the National Weather Service (NWS) for areas surrounding the facility. EOC personnel monitored weather conditions and declared an Alert at 2:34 p.m. due to the issuance of a tornado warning by the NWS. The facility shelter alarm was sounded and personnel were evacuated to designated indoor sheltered areas. SNM was properly secured. The inspector noted that personnel in [REDACTED] questioned their need to evacuate and informed the safety manager. Further review was planned.

(2) **Conclusions**

The EOC was activated and properly responded to a tornado warning on September 17. SNM was secured and personnel were sheltered.

b. **Quarterly Emergency Preparedness Drill**

(1) **Inspection Scope and Observations**

The third quarter Emergency Preparedness (EP) drill was conducted on September 20. The drill scenario simulated a non-radiological personnel injury and emergency response. The inspector observed the second shift drill team assemble in the Alternate EOC [REDACTED]. The EOC team provided effective emergency response support. Necessary communication equipment, including phones and fax, and EP procedures were available. The Incident Assessment Flow Chart and EP notification procedure were used effectively. No post-drill critique items were identified by the EOC staff.

(2) **Conclusions**

The quarterly EP drill effectively tested the EOC personnel and demonstrated adequacy of the Alternate EOC.

6. **Transportation (TI 2600/006)**

a. **Industrial Waste Landfill Soil Shipment**

Radioactive material excavated from IWL Number 1 (see Section 4) was packaged for transport [REDACTED] to an off-site disposal facility. The material, consisting of contaminated soil, was properly classified as Class A waste. NRC Forms 540, 541 and 741 were completed in accordance with applicable regulatory requirements and site procedures. The inspector observed excavated soil which was placed into soft sided containers and loaded [REDACTED] containers, [REDACTED]. The material was protected from moisture by a plastic cover, to minimize any material seepage.

b. **Conclusions**

Contaminated soil from IWL Number 1 was properly loaded for transport to a disposal facility. The shipping manifest accurately described the shipment.

7. **Exit Meeting**

The inspection scope and results were summarized on October 21, 2004, with W. Nash, Vice President and General Manager, and other members of the licensee's staff. Although proprietary documents and processes were occasionally reviewed during this inspection, the proprietary nature of these documents or processes was deleted from Part 1 of this report. No dissenting comments were received from the licensee.

[REDACTED]

[REDACTED]

ATTACHMENT

1. **LIST OF PERSONS CONTACTED**

Licensee

T. Brown, Manager, Operations
C. Carr, Manager, Administration and Security
J. Compher, Industrial Engineering
J. Creasey, Manager, Uranium Processing Operations
L. Morrell, Licensing & Safety Analysis
W. Nash, Vice President and General Manager
H. Nicks, Manager, Security
J. Noel, Manager, NRC Security
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>
70-27/2004-07-01	Opened/Closed	NCV - SNM [REDACTED] Stored in Violation of NCS Posting Requirements

3. **INSPECTION PROCEDURES USED**

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

4. **LIST OF ACRONYMS USED**

CA	Corrective Action
EOC	Emergency Operations Center
EP	Emergency Preparedness
IWL	Industrial Waste Landfill
MAA	Material Access Area
NCS	Nuclear Criticality Safety
NCV	Non-cited Violation
NWS	National Weather Service
OP	Operating Procedure
ORISE	Oak Ridge Institute for Science and Education
RP	Radiation Protection
[REDACTED]	[REDACTED]
RWP	Radiation Work Permit

[REDACTED]

[REDACTED]



SAR	Safety Analysis Report
SNM	Special Nuclear Material
SRC	Safety Review Committee
TI	Temporary Instruction
UR	Uranium Recovery

