UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
SAM NUNN ATLANTA FEDERAL CENTER
61 FORSYTH STREET SW SUITE 23T85
ATLANTA, GEORGIA 30303-8931

[redacted]

June 20, 2006

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

SUBJECT: NRC INSPECTION REPORT NO. 70-27/2006-004

Dear Mr. Nash:

This refers to the inspection conducted from April 16 through May 27, 2006, 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 included: Plant Operations, Management Organization and Controls, and Radiation 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 was treated as a non-cited violation (NCV) consistent with Section VI.A.8 of the Enforcement Policy. If you contest this violation or its significance, 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, the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001, and the NRC Senior Resident Inspector at your facility.

Thank you for your response letter dated May 2, 2006 to our Notice of Violation which was issued on April 3, 2006. The reply met the requirements of 10 CFR 2.201 and your corrective actions will be reviewed in an upcoming inspection.

[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

Enclosure: NRC Inspection Report

cc w/encl:
Leah R. Morrell
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*see previous concurrence page

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ADAMS: X☐ Yes ACCESSION NUMBER:_____

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DATE	5/ /2008	06/14/2006	06/20/2006	5/ /2008	5/ /2008	5/ /2008	5/ /2008
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U. S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.:	70-27
License No.:	SNM-42
Report No.:	70-27/2006-004
Licensee:	BWX Technologies, Inc.
Facility:	Nuclear Products Division
Location:	Lynchburg, Virginia
Dates:	April 16 through May 27, 2006
Inspector:	G. Wertz, Senior Resident Inspector
Approved by:	David A. Ayres, Chief Fuel Facilities Inspection Branch 1 Division of Fuel Facility Inspection

Enclosure

[redacted]

NRC INSPECTION REPORT 70-27/2006-004

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, and Radiation Protection.

Plant Operations

- A non-cited violation occurred when inadequate maintenance rendered an Item Relied On For Safety out of service and a lack of controls allowed operation of the associated hazardous equipment. Following discovery, the immediate corrective actions implemented were effective to ensure safety. A root cause investigation identified procedure adherence and maintenance process control deficiencies (Paragraph 2.a).

- The Lynchburg Technology Center [redacted] completed the [redacted]. The total dose received by the operators was below the planned dose estimate. The cause of a dropped [redacted] event was properly evaluated and the corrective actions were effective to prevent a similar event (Paragraph 2.b).

- Special Nuclear Material [redacted] were packaged for shipment in accordance with the container's Certificate of Compliance (Paragraph 2.c).

Management Organization and Controls

- Evaluation and corrective action for three special nuclear material handling events were appropriate. An operator's self-identification of a problem ensured effective corrective actions were developed and implemented before the issue became a more significant safety concern (Paragraph 3.a).

- Corrective actions were adequate for an event involving a shipping container that was sent to another fuel facility without being completely emptied of empty [redacted]. No special nuclear material was involved in the shipment and the transportation procedure was revised to verify that the container was empty before shipment (Paragraph 3.b).

- Management initiated an independent, comprehensive audit of lifting operations following a dropped load. Audit results identified several recommendations for improvement which were added to the commitment tracking system. No safety concerns were identified (Paragraph 3.c).

[redacted]

[redacted]

Radiation Protection

- [redacted] operators responded properly to a special nuclear material spill. Radiation work permit requirements effectively controlled radiation exposure during recovery of the material (Paragraph 4).

Attachment:
Partial Listing of Persons Contacted
List of Items Opened, Closed and Discussed
Inspection Procedures Used

[redacted]

[redacted]

REPORT DETAILS

1. **Summary of Plant Status**

Routine fuel manufacturing operations and maintenance activities were conducted in the [redacted] process areas, [redacted] Uranium recovery, downblending and other routine operations and maintenance activities were conducted in the [redacted] facility.

NRC Nuclear Security and Incident Response (NSIR) and Department of Energy (DOE) National Nuclear Security Administration (NNSA) personnel toured the facility on May 4, 2006.

NRC NSIR Deputy Director, William Borchardt, toured the facility on May 18, 2006.

Major Management Changes

In Uranium Processing Services, Christa Reed, the former Section Manager for UR and Downblending Operations, replaced retiring Production Control Manager, Margaret Turner, in the Operations Department, effective May 1, 2006. Her UR responsibilities were transferred to Scott Nagley, Section Manager for Fuel Development, since Downblending Operations will finish in June.

Downblending Staffing Reorganization

In preparation of completion of the [redacted] high enriched uranium downblending project, management announced plans to reduce the Downblending staff, following the end of plant shutdown, on July 5, to one foreman and seven operators. This staff will perform maintenance and material cleanup activities. On September 1, this staff will be further reduced to one foreman and three operators who will attend to equipment needs until the resumption of downblending activities (not anticipated before early 2007). All displaced workers were reassigned to other jobs within the facility.

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

a. [redacted] Alarm System IROFS Unavailable

(1) Inspection Scope and Observations

The inspector reviewed an event, identified in corrective action (CA) BWX 2007709, involving an Item Relied on For Safety (IROFS) which was removed from service for maintenance on April 26, 2006. The IROFS was scheduled to be returned to service the following day, but was not and remained out of service until identified by the area operations manager on May 9, 2006. In the intervening period, equipment was

[redacted]

operated on three occasions for which this IROFS was designated to mitigate the associated Integrated Safety Analysis (ISA) accident and was a violation of License Application Section 1.9.2 and 10 CFR 70.61(e) requirements.

The inspector reviewed Safety Analysis Report (SAR) 15.18 and noted that two other IROFS credited with prevention of a High or Intermediate Consequence Event remained available. The inspector reviewed the SAR risk matrix and concluded that the probability of a High or Intermediate Consequence Event remained highly unlikely.

The inspector interviewed maintenance and operations managers and staff and identified procedure, communication and control weaknesses which contributed to the failure to maintain the IROFS.

- Procedure Adherence - maintenance technicians did not use the operating procedure (OP) described in the work order to perform the work.
- Procedure Adequacy - the OP, available for reference, was uncontrolled and several revisions out of date (Rev. 6 versus the current Rev. 16).
- Communications - maintenance technicians did not communicate that the work was not complete to the operations foreman.
- Controls - the work order was signed as completed even though the IROFS remained out of service for a 24 hour "burn-in" period.
- Controls - no formal process was available to ensure the IROFS was returned to service following the burn-in period.
- Controls - the user (operations) was responsible for isolating the system's hazards instead of the organization (maintenance) performing the work.

The root cause investigation team identified similar issues. However, the procedure adherence aspect was not evident until questioned by the inspector. The immediate corrective actions implemented by the operations manager included verification of all IROFS prior to system operation. The root cause investigation team recommended numerous improvements in procedure adherence, controls and communications which were reviewed and approved by management and captured in the commitment tracking system. The inspector reviewed the commitments and concluded their implementation would be effective to ensure proper maintenance of IROFS. As such, this non-repetitive, licensee identified and corrected condition was treated as a non-cited violation (NCV) consistent with Section VI.A.8 of the Enforcement Policy (NCV 70-27/2006-004-01, Inappropriate Maintenance Resulted in the Failure to Maintain Available an Item Relied on For Safety).

(2) Conclusions

A NCV occurred when inadequate maintenance rendered an IROFS out of service and a lack of controls allowed operation of the associated hazardous equipment. Following

[redacted]

discovery, the immediate corrective actions implemented were effective to ensure adequate safety. A root cause investigation identified procedure adherence and maintenance process control deficiencies.

b. [redacted]

(1) Inspection Scope and Observations

The inspector reviewed CAs for the April 11, 2006, for the Lynchburg Technology Center (LTC) dropped [redacted] event (see NRC Inspection Report (IR) 70-27/2006-003) and observed a transfer operation following implementation of the changes. The CAs involved replacing the rope with a wire and protecting the wire from the sharp edge of the canister lifting lug. Also, the wire was tested and a torque limit established on the lifting mechanism motor. The wire significantly exceeded the tension capacity of the rope and the expected weight of the [redacted]. The inspector observed a transfer using the wire and confirmed its acceptability.

Following completion of the [redacted], the total dose was approximately 134 milli-Roentgen Equivalent Man (mrem) (or 10 mrem/transfer) which was below the estimated project plan of 18 mrem/transfer.

(2) Conclusions

The LTC [redacted]. The dose received by the operators was below the planned dose estimate. The cause of [redacted] event was properly evaluated and the corrective actions were effective to prevent a similar event.

c. SNM Shipment Preparation

(1) Inspection Scope and Observations

The inspector observed workers package SNM [redacted] for shipment. The work was done in accordance with Container Specification and Inspection Report (CSIR) for Certificate of Compliance 9099.

(2) Conclusions

SNM [redacted] were packaged for shipment in accordance with the container's Certificate of Compliance.

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

a. Corrective Action Review of SNM Handling Events

(1) Inspection Scope and Observations

The inspector reviewed CAs associated with SNM handling events documented in BWX 2005320, 2005889, and 2005793. In all three cases, NCS engineers evaluated the resulting k-effective and the inspector agreed that any change was negligible. The inspector reviewed the applicable scenarios listed in the Safety Evaluation Report and noted sufficient IROFS were maintained to ensure a criticality event remained highly unlikely. Corrective actions involved raising the operators' awareness through training. Particularly noteworthy was the UR operator's self-identification of BWX 2005793 and the area supervisor's prompt response. These actions ensured that the CAs were effective and implemented before the issue increased beyond minor safety significance.

(2) Conclusions

Evaluation and corrective action for three SNM handling events were appropriate. An operator's self-identification of a problem ensured effective CAs were developed and implemented before the issue became a more significant safety concern.

b. Corrective Action Review of Transportation Event

(1) Inspection Scope and Observations

The inspector reviewed an event where a B-25 container, used to transfer empty [redacted] from another fuel facility back to BWXT, was not sent empty, but with [redacted] empty [redacted]. No SNM was involved in the shipment. The root cause review concluded that the empty [redacted] were probably left in the B-25 container during a work stoppage and the CSIR did not have sufficient detail to distinguish between a completely or partially empty B-25 container. The CAs included revision of the CSIR to verify the B-25 was empty before shipment and operator training. The issue was documented in CA BWX 2002360.

(2) Conclusions

The CAs were adequate for an event where a B-25 container had been sent to another fuel facility without being completely emptied of empty [redacted]. No SNM was involved in the shipment and the transportation procedure was revised to verify that the B-25 was empty.

[redacted]

b. Independent Audit of Vertical Lifting Operations

(1) Inspection Scope and Observations

An independent audit of lifting operations was initiated following a [redacted] drop event (see NRC IR 70-27/2006-003). The independent audit interviewed operators responsible for heavy lifting operations, on all three shifts, to solicit any concerns. No immediate safety issues were identified. Recommendations for improvement were identified, evaluated by management, and added to the CA commitment tracking program.

(2) Conclusions

Management initiated an independent, comprehensive audit of lifting operations following a dropped load. Audit results identified several recommendations for improvement which were added to the commitment tracking system. No safety concerns were identified.

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

a. Inspection Scope and Observations

The inspector observed operators recovering spilled SNM from the [redacted] on May 4, 2006. The spill occurred when an operator inadvertently dropped [redacted] containing SNM. Operators immediately evacuated the area which was then properly posted to limit access. Radiation work permit (RWP) 06-038 was developed to vacuum the SNM. Proper respiratory protection was used and the area was cleaned and returned to normal operation later that day.

b. Conclusions

[redacted] operators responded properly to an SNM spill. RWP requirements effectively controlled radiation exposure during recovery of the SNM.

5. **Exit Meeting**

The inspection scope and results were summarized on June 2, 2006, with 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

R. Cochrane, Manager, Operations
J. Creasey, Manager, Uranium Processing
L. Duncan, Manager, Nuclear Criticality Safety
L. Morrell, Manager, Licensing & Safety Analysis
W. Nash, Vice President and General Manager
T. Nicks, Manager, Security
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

Item Number	Status	Description
70-27/2006-004-01	Opened	NCV - Inappropriate Maintenance Resulted in the Failure to Maintain an Item Relied on For Safety Available (Paragraph 2.a)

3. INSPECTION PROCEDURES USED

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