



UNITED STATES
NUCLEAR REGULATORY COMMISSION

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

November 30, 2007

NRC Event No. 43728

Mr. R. P. Cochrane, General Manager
BWX Technologies, Inc.
Nuclear Products Division
P. O. Box 785
Lynchburg, VA 24505-0785

SUBJECT: NRC INSPECTION REPORT NO. 70-27/2007-007

Dear Mr. Cochrane:

This refers to the inspection conducted from September 23 through November 3, 2007, 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, Maintenance and Surveillance, Radiation Protection, Operator Training, Radioactive Waste Management, and Fire Protection. Within these areas, the inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observation of activities in progress.

Within the scope of the inspection, no violations or deviations were identified.

By letter dated November 2, 2007, we received your reply to our revised Notice of Violation (70-27/2006-08-01) which was issued on June 27, 2007. In order to fully understand your planned corrective action, a telephone conference call was conducted between NRC Region 2 staff and L. Morrell, Manager of Licensing and Safety Analysis, on November 8, 2007. Ms. Morrell indicated that the corrective action stated in the reply was to implement a program to verify that controls described in the Safety Analysis Reports were available prior to the operational release of the affected area. The reply met the requirements of 10 CFR 2.201 and your corrective action will be reviewed during an upcoming inspection.

By letter dated November 16, 2007, we received your reply to our Notice of Violation which was issued on October 19, 2007. The reply met the requirements of 10 CFR 2.201 and your corrective action will be reviewed during an upcoming inspection.

R. Cochrane

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and Enclosures, will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/readingrm/adams.html>.

Sincerely,

Manuel Crespo for /RA/

Thomas R. Decker, Acting 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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U. S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.: 70-27

License No.: SNM-42

Report No.: 70-27/2007-007

Licensee: BWX Technologies, Inc.

Facility: Nuclear Products Division

Location: Lynchburg, Virginia

Dates: September 23 through November 3, 2007

Inspectors: G. Wertz, Senior Resident Inspector
D. Hartland, Senior Fuel Facility Inspector
O. Lopez, Fuel Facility Inspector

Approved by: Thomas R. Decker, Acting Chief
Fuel Facilities Inspection Branch 1
Division of Fuel Facility Inspection

Enclosure

EXECUTIVE SUMMARY

BWX Technologies, Inc., Nuclear Products Division
NRC INSPECTION REPORT 70-27/2007-007

This inspection included periodic observations conducted by the Senior Resident Inspector during normal and off-normal shifts in the areas of Plant Operations, Management Organization and Controls, Maintenance and Surveillance, and Radiation Protection. A specialized inspection and review of documentation was conducted by regional inspectors in the areas of Operator Training, Radioactive Waste Management, and Fire Protection (October 15 through 18).

Plant Operations

- Special nuclear material operations were conducted in accordance with approved procedures and nuclear criticality safety postings (Paragraph 2.a).
- The 3rd Quarter Emergency Preparedness drill effectively tested the Emergency Management Organization's response to a simulated accident situation (Paragraph 2.b).
- A spill of acidic waste water was contained on-site, and notifications to the appropriate state and federal agencies were properly performed (Paragraph 2.c).

Management Organization and Controls

- The corrective action for a contamination event involving raffinate solution which contacted a worker's facial area was to replace the existing face shields with an improved style designed to provide enhanced protection of the workers' face (Paragraph 3).

Maintenance and Surveillance

- The Criticality Monitoring System was modified to include detectors located in the Container Storage Facility. Effective work planning, radiation protection controls, and post-installation functional testing were established and implemented during the modification (Paragraph 4).

Radiation Protection

- Radiation work permit requirements were effective and adequately implemented (Paragraph 5).

Operator Training

- Operators possessed sufficient knowledge to safely conduct waste handling activities (Paragraph 6).

Radioactive Waste Management

- Low level radioactive waste was properly stored and packaged for disposal in accordance with regulatory requirements (Paragraph 7).

Fire Protection

- Fire protection, detection and suppression systems, including Items Relied On For Safety, were properly maintained. The process areas, equipment, and material storage areas were operated in accordance with fire safety requirements. The pre-fire plan was current (Paragraph 8).

Attachment:

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

REPORT DETAILS

1. **Summary of Plant Status**

Routine fuel manufacturing operations and maintenance activities were conducted in the fuel process areas and in the Research Test Reactors and Targets (RTRT) facility. Uranium recovery was conducted in the Uranium Recovery (UR) facility.

2. **Plant Operations (Inspection Procedure (IP) 88135)**

a. Routine Observations

(1) Inspection Scope and Observations

The inspectors observed special nuclear material (SNM) operations and noted that the work was performed in accordance with approved operating procedures (OPs), nuclear criticality safety (NCS) postings, and radiation work permits (RWPs). The inspectors observed that controls used to contain dispersable radioactive material in material access areas (MAAs) were in proper working condition and that personal protective clothing and dosimetry were properly worn. Routine fire safety tours verified that fire safety systems were maintained and housekeeping was sufficient to minimize fire risk. The emergency operations center (EOC) was maintained in a state of readiness.

(2) Conclusions

SNM operations were conducted in accordance with OPs and NCS postings.

b. Emergency Preparedness Drill

(1) Inspection Scope and Observations

On September 26, the inspectors observed Emergency Preparedness drills conducted on 1st and 3rd shifts. The drill scenarios effectively tested the Emergency Management Organization's response to a simulated accident involving licensed material. Drill participants provided effective feedback during the post-drill critiques.

(2) Conclusions

The 3rd Quarter Emergency Preparedness drill effectively tested the Emergency Management Organization's response to a simulated accident situation.

c. Acidic Wastewater Spill (Event Notification 43728)

(1) Inspection Scope and Observations

On October 16, an operator identified that acidic solution had overflowed a waste water drain trough and spilled down an adjacent service road. Environmental engineering determined approximately 275 gallons of solution had overflowed. Residue on the pavement clearly indicated that none of the solution reached the nearest storm drain

and, therefore, remained within the protected area. The affected areas were neutralized with soda ash. The amount spilled involved a Reportable Quantity and notifications to the National Response Center, Virginia Department of Environmental Quality, and the Environmental Protection Agency - Region III were performed. The NRC was properly notified (Event Notification 43728) in accordance with 10 CFR 70, Appendix A, "Concurrent Reports." The condition was captured in corrective action (CA) 2011350. The inspectors reviewed the affected area with the cognizant environmental engineer and no safety nor environmental concerns were identified.

(2) Conclusions

A spill of acidic waste water was contained on-site and notifications to the appropriate state and federal agencies were properly performed.

3. **Management Organization and Controls (IP 88135)**

a. Inspection Scope and Observations

The inspectors reviewed Unusual Incident Report (UIR) 2019783 which documented a contamination event involving a UR worker who was removing solidified material from the bottom of a solvent extraction vessel. The freed solids, along with raffinate solution, were allowed to fall into a collection tray. During the process, some of the raffinate solution splashed under the worker's face shield and contacted the skin around his mouth. The worker was promptly treated for potential external (skin) radioactive contamination and chemical exposure. Radiological skin surveys were negative and calcium gluconate was applied to the affected area as a precaution. A bio-assay kit was administered and the results were negative. A comprehensive investigation was performed which resulted in the replacement of the existing face shields with a design having an improved sealing configuration around the workers' facial area. The inspectors reviewed the event with the affected worker and the responsible foreman, observed the use of the new face shields, and concluded that the CA was appropriate.

b. Conclusions

The CA for a contamination event involving raffinate solution which contacted a worker's facial area was adequate to prevent recurrence. The CA resulted in replacement of the existing face shields with an improved style designed to provide enhanced protection of the workers' face.

4. **Maintenance and Surveillance (IP 88135)**

a. Inspection Scope and Observations

On October 28, the facility halted SNM operations while the Criticality Monitoring System (CMS) was modified to connect detectors located at the Container Storage Facility (CSF). The CMS modification involved disabling various CMS detector coverage areas while the new detectors were installed. The work was properly controlled by Radiation Protection (RP). Site access was limited to essential workers who were provided radiation monitors and radios. Emergency team members were stationed at various locations and an RP technician monitored the CMS alarm panel. A pre-job brief was

conducted prior to the CMS outage. The work was performed in accordance with Work Order (WO) 20031997. Following work completion, the CMS was successfully functionally tested in accordance with the WO Test Plan and the applicable RP procedure for the CMS.

b. Conclusions

The CMS was modified to incorporate detectors located in the CSF. Effective work planning, RP controls, and post-installation functional testing were established and implemented during the modification.

5. **Radiation Protection (IP 88135)**

a. Inspection Scope and Observations

The inspectors observed activities conducted in accordance with RWP 07-067 to remove filters from a glovebox in the Specialty Fuel Facility area. The RWP requirements were effective to protect the workers and adequately implemented.

b. Conclusions

RWP requirements were effective and adequately implemented.

6. **Operator Training (IP 88010)**

a. Inspection Scope and Observations

The inspectors reviewed training materials and records and discussed general, process-specific, and on-the-job training requirements with waste handling operators. The operators possessed sufficient knowledge to safely conduct waste handling activities. NCS, general employee safety, and radiation worker refresher training were adequate in scope and detail.

b. Conclusions

Operators possessed sufficient knowledge to safely conduct waste handling activities.

7. **Radioactive Waste Management (IP 88035)**

a. Inspection Scope and Observations

The inspectors reviewed the program for classification, documentation and handling of low-level radioactive waste (LLRW) for disposal, and observed the licensee prepare and load a shipment of LLRW for offsite disposal. The waste was classified in accordance with 10 CFR 61.55. The LLRW containers were properly labeled, sealed, and secured in the trailer. Radioactive surveys of the trailer were done correctly and it was properly placarded.

The program for the storage and management of LLRW was reviewed for adequacy of storage, waste container integrity, and labeling. The inspectors toured the radioactive

material and waste storage areas with the responsible supervisor and observed the storage of non-recoverable solid and liquid LLRW in 55 gallon drums for compaction, shipment, and/or offsite disposal. The waste containers were labeled properly and the areas posted. The containers were in proper physical condition with no integrity or degradation concerns observed. The licensee established and maintained adequate management controls including training, procedures, and audits to ensure compliance with the requirements of Appendix G of 10 CFR 20, 10 CFR 61.55, and 10 CFR 61.56.

b. Conclusions

LLRW was properly stored and packaged for disposal in accordance with regulatory requirements.

8. **Fire Protection (IP 88055)**

a. Inspection Scope and Observations

The SNM processes, equipment, and material storage areas were operated in accordance with fire safety requirements. Combustible and flammable materials were controlled throughout the facility. Maintenance records and selected fire detection system components, including the fire alarm central station, smoke detectors, and heat detectors, were implemented and maintained properly. The fire suppression and protection systems in the fuel process and UR areas were observed and Items Relied On For Safety (IROFS) were adequately maintained. Sprinklers were unobstructed and the water supply was readily available with correct valve positioning and pumping capacity. The pre-fire plans for the fuel process and UR were accurate.

b. Conclusions

Fire protection, detection and suppression systems, including IROFS, were maintained properly. The process areas, equipment, and material storage areas were operated in accordance with fire safety requirements. The pre-fire plan was accurate.

9. **Followup of Previously Identified Issues (IP 88135)**

a. Violation (VIO) 70-27/2007-04-02: Failure to Immediately Notify Safety Management Following a Test Failure of a IROFS

The inspectors observed weekly testing on October 15, and questioned the operators and foreman who indicated in their responses an adequate understanding of the requirement to notify safety management of unsatisfactory IROFS test results. NCS provided training to the operators to reiterate the notification requirements. The inspectors concluded that the CAs were adequate and the item was closed.

- b. VIO 70-27/2007-02-01: Failure to Evaluate a Facility Change Affecting an IROFS; and VIO 70-27/2007-02-02: Failure to Follow NCS Quality Assurance Procedure

The inspectors reviewed the completed CAs which included a root cause investigation, the re-training of workers authorized to perform safety reviews, and the implementation of enhanced safety release review requirements. The inspectors concluded that the CAs were adequate and the items were closed.

- c. VIO 70-27/2007-02-03: Failure to Establish IROFS

The inspectors reviewed the completed CAs which involved a revision to the Integrated Safety Analysis (ISA) summary to include a passive control for separation of hydraulic fluid and fuel. The licensee also reviewed other changes made to the ISA summary in 2006 in order to verify that no other IROFS had inadvertently been removed, and revised procedural guidance to assure that any IROFS removed were fully captured by documented analyses. The inspectors concluded that the CAs were adequate and the item was closed.

- d. VIO 70-27/2006-02-02: Failure to Perform Annual Sprinkler Standpipe Flow Test

The inspectors reviewed the completed CAs and discussed their implementation with the responsible technicians. The licensee performed a main drain test on all sprinkler systems discussed in SNM-42, and added the main drain test to the fire protection system tracking system. The inspectors concluded that the CAs were adequate to ensure the required testing of sprinkler systems was performed properly and the item was closed.

- e. Inspector Followup Item (IFI) 70-27/2007-02-04: Completion of the Integrated Safety Analysis Review for the Internal Flooding Scenario

In response to the inspectors' questions concerning the potential affect on other areas of the facility from an internally-generated flood (see NRC Inspection Report 70-27/2007-02 for the January 11, 2007, event), the licensee formed an ISA review team and evaluated the issue. Their conclusion, captured in Technical Work Record (TWR) 07-0002, indicated that a flood adversely affecting licensed material (criticality) was highly unlikely based on the location of the existing underground service water lines. The inspectors reviewed the TWR and agreed with the licensee's conclusion. The IFI was closed.

10. **Exit Meeting**

The inspection scope and results were summarized on October 18, and November 8, 2007, with R. Cochrane, General Manager, and other members of the licensee's staff. Although proprietary information and processes were reviewed during this inspection, no proprietary information was included in this report. No dissenting comments were received from the licensee.

1. **LIST OF PERSONS CONTACTED**

J. Burch, Manager, Operations
R. Cochrane, General Manager
J. Creasey, Manager, Uranium Processing
D. Faidley, Acting Manager, Nuclear Criticality Safety
L. Morrell, Manager, Licensing & Safety Analysis
T. Nicks, Manager, Security
S. Schilthelm, Advisory Engineer for Special Projects
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>
70-27/2007-04-02	Closed	VIO - Failure to Immediately Notify Safety Management Following a Test Failure on an Item Relied on For Safety (Paragraph 9.a).
70-27/2007-02-01	Closed	VIO - Failure to Evaluate a Facility Change Affecting IROFS (Paragraph 9.b).
70-27/2007-02-02	Closed	VIO - Failure to Follow NCS Quality Assurance Procedure (Paragraph 9.b).
70-27/2007-02-03	Closed	VIO - Failure to Establish IROFS (Paragraph 9.c).
70-27/2006-02-02	Closed	VIO - Failure to Perform Annual Sprinkler Standpipe Flow Test (Paragraph 9.d).
70-27/2007-02-04	Closed	IFI - Completion of the Integrated Safety Analysis Review for the Internal Flooding Scenario (Paragraph 9.e).

3. **INSPECTION PROCEDURES USED**

IP 88135 Resident Inspection Program for Category I Fuel Cycle Facilities
IP 88055 Fire Protection (Annual)
IP 88010 Operator Training
IP 88035 Radioactive Waste Management