



UNITED STATES
NUCLEAR REGULATORY COMMISSION

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

[REDACTED]

July 30, 2007

NRC Event No. 43330

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. 70-27/2007-004 AND NOTICE OF VIOLATION

Dear Mr. Cochrane:

This refers to the inspection conducted from May 20 through June 30, 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, Radiation Protection, and Emergency Preparedness. 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. The violation was evaluated in accordance with the NRC Enforcement Policy available on the NRC's Web site at www.nrc.gov. The violation is cited in the 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.

You are required to respond to this letter and should follow the instructions specified in the enclosed Notice when preparing your response. For your consideration, NRC Information Notice 96-28, "Suggested Guidance Related to Development and Implementation of Corrective Action," is available on the NRC's Web site. The NRC will use your response, in part, to determine whether further enforcement action is necessary to ensure compliance with regulatory requirements.

[REDACTED]

[REDACTED]

R. P. Cochran

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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 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.

By letter dated June 6, 2007, we received your reply to our Notice of Violation issued in NRC Inspection Report 70-27/2007-002 on May 7, 2007. The reply met the requirements of 10 CFR 2.201 and your corrective actions will be reviewed during an upcoming inspection.

[REDACTED]

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

Sincerely,

Manuel Crespo for /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

Leslie P. Foldesi, Director
Bureau of Radiological Health
Division of Health Hazards Control
Department of Health
1500 East Main Street, Room 240
Richmond, VA 23219

Distribution w/encls: (See page 3)

[REDACTED]



R. P. Cochrane

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Distribution w/encls:

D. Ayres, RII

A. Gooden, RII

J. Munday, RII

G. Wertz, RII

M. Adams, NMSS

M. Kotzalas, NMSS

N: Rivera-Feliciano, NMSS

J. Cruz, NSIR

J. Wiebe, NMSS

*see previous concurrence



ADAMS: Yes ACCESSION NUMBER: _____

OFFICE	RII:DFFI	RII:DFFI	RII:DFFI			
SIGNATURE		/RA/				
NAME	GWertz:*	AGooden*				
DATE	07/26/2007	07/26/2007	May 19, 2008	May 19, 2008	May 19, 2008	May 19, 2008
E-MAIL COPY?	YES NO	YES	YES NO	YES NO	YES NO	YES NO

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[REDACTED]

NOTICE OF VIOLATION

BWX Technologies, Inc.
Lynchburg, Virginia

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

During NRC inspection activities conducted between May 20 and June 30, 2007, a violation of NRC requirements was identified. In accordance with the NRC Enforcement Policy, the violation is listed below:

Safety Condition S-1 of NRC license SNM-42 authorizes the use of nuclear materials in accordance with Chapters 1-11 of the License Application submitted on October 24, 2006, and supplements thereto.

License Application, Section 11.2.1, Surveillance Monitoring and Functional Testing, required immediate notification of Safety Management if an Item Relied On For Safety fails a surveillance test.

License Application, Section 11.4, Procedures, requires that activities involving licensed material shall be performed in accordance with written and approved procedures. Operating Procedure 0021001, Section B, Chapter 1.0, Safety System Checks, required the processing area supervision to notify the Nuclear Criticality Safety Manager, if the [REDACTED] valve test failed.

Contrary to the above, on April 30, 2007, the [REDACTED] valve failed the weekly surveillance test and neither Safety Management nor the Nuclear Criticality Safety Manager were notified.

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, and a copy to the NRC Resident Inspector at BWX Technologies, Inc., 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.

[REDACTED]

Enclosure 1

[REDACTED]

NOV

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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 should 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]

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

Dated this 30th day of July 2007

[REDACTED]

[REDACTED]

U. S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.: 70-27

License No.: SNM-42

Report No.: 70-27/2007-004

Licensee: BWX Technologies, Inc.

Facility: Nuclear Products Division

Location: Lynchburg, Virginia

Dates: May 20 through June 30, 2007

Inspectors: G. Wertz, Senior Resident Inspector
A. Gooden, Senior Fuel Facility Inspector

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

Enclosure 2

[REDACTED]

[REDACTED]

EXECUTIVE SUMMARY

BWX Technologies, Inc., Nuclear Products Division
NRC INSPECTION REPORT 70-27/2007-004

This inspection included periodic observations conducted by the Senior Resident Inspector during normal and off-normal shifts in the areas of Plant Operations, Radiation Protection, and Emergency Preparedness. A specialized inspection involving the observation and evaluation of the [REDACTED] emergency exercise was conducted by a regional inspector in the area of Emergency Preparedness [REDACTED]

Plant Operations

- On April 30, 2007, an [REDACTED] valve, designated as an Item Relied On For Safety (IROFS), failed its weekly surveillance test. The Root Cause Investigation Team identified several causes and implemented appropriate corrective actions (Paragraph 2.a).
- A non-cited violation was identified when a [REDACTED] valve, classified as an Item Relied on For Safety, was modified using a maintenance work order process rather than the change management process as specified in License Application, Section 11.1.3 (Paragraph 2.a).
- A violation was identified when safety management was not notified following the surveillance test failure of a [REDACTED] valve, classified as an IROFS, as required by License Application, Section 11.2.1 and Operating Procedure 0021001 (Paragraph 2.a).
- On June 25, 2007, radiation protection staff properly responded during a severe electrical storm which caused four (4) Criticality Monitoring System detectors to fail upscale and alarm. Storm watch provisions were enacted and manual radiological monitoring was performed until the detectors were replaced (Paragraph 2.b).

Radiation Protection

- Radioactive sources were properly handled during replacement activities (Paragraph 3.a).
 - [REDACTED] radioactive waste drum was performed safely and in accordance with the radiation protection requirements specified in the radiation work permit (Paragraph 3.b).
- [REDACTED]

Emergency Preparedness

- The licensee's response to mitigate the postulated accident was considered successful. The scenario details were adequate for evaluating the onsite response capability and the state of readiness for responding to incidents. The critique was an adequate assessment of the response and items were identified for program improvement or corrective actions (Paragraph 4.a).
- The licensee demonstrated a safe and effective site evacuation during the performance of their [REDACTED] evacuation drill on [REDACTED] (Paragraph 4.b).

Attachment:

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

[REDACTED]

REPORT DETAILS

1. Summary of Plant Status

Routine fuel manufacturing operations and maintenance activities were conducted in the fuel process areas and in the [REDACTED] facility. Uranium recovery was conducted in the [REDACTED] facility.

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

a. Surveillance Test Failure of an Item Relied on For Safety

(1) Inspection Scope and Observations

On April 30, 2007, the [REDACTED] valve for [REDACTED], designated as an Item Relied on For Safety (IROFS), failed its weekly surveillance test. The valve's safety function, as designated in the Integrated Safety Analysis (ISA), was to open to allow [REDACTED] to drain from the tank [REDACTED] before enough SNM could accumulate to cause a potential criticality event. The [REDACTED] valve failure resulted in the associated ISA scenario not remaining "highly unlikely." Information concerning the event was provided to the NRC in Event Notification 43330. Operations in the processing area were halted pending a root cause investigation review.

Interim Review and Corrective Actions

The Root Cause Investigation team completed an interim review on May 4, in order to allow [REDACTED], which used similar [REDACTED] valves, to return to service. The team determined that the valve in [REDACTED] was modified in November 2006, and the internal [REDACTED] had been replaced with one made of a different material. The modification was initiated because the valve's opening had been gradually deteriorating (slower). The team noted that [REDACTED] was not drained daily as were the other three tanks and therefore, the [REDACTED] valve material may have become susceptible to sticking or "taking a set." In addition, the vendor had recommended a lower air pressure for the new [REDACTED] material, and [REDACTED]. Neither recommendation was implemented. Interim corrective actions (CAs) were implemented which included establishing an acceptance criteria for the valves' opening time (and recording it for trending), ensuring that the valves were cycled daily, and reducing the valves' air supply pressure as recommended by the vendor. The inspectors reviewed the CAs and concluded that it was acceptable to resume operation of [REDACTED]

[REDACTED]

Root Cause Analysis

On May 24, the team completed their final evaluation and identified root causes involving design (D), preventive maintenance (PM) and procedural discrepancies. In design, the valve modification was done in accordance with a "like-kind" determination using a work order. As such, the change lacked the more rigorous review required by the licensee's modification process, and failed to identify the pressure reduction associated with the new [REDACTED] material. Regarding PM, the [REDACTED] valves lacked a PM program to ensure proper air pressure regulation. In addition, the testing procedure had no acceptance criteria established for the [REDACTED] valves' opening times during their weekly testing. The completed CAs included the replacement of the [REDACTED] tank valve [REDACTED] with the original material type, implementation of weekly test acceptance criteria (opening time), daily verification that the valves were cycling, and adjustment of the supply air pressure in accordance with the vendor's recommendation. Longer term CAs included a review of the application of the "like-kind" process when applied to IROFS, and the implementation of PM to capture the air pressure and cycle life for all four [REDACTED] valves. The inspectors concluded that the CAs appeared effective to identify and correct valve performance deterioration prior to failure.

Risk Significance

The risk significance of the event was low since the valve failure was identified during testing and no SNM was present in the tank. However, the worst-case scenario involved failure of the valve to open coincident with the failure to remove SNM [REDACTED] [REDACTED] from the tank which could result in a criticality event. As such, the operator's actions to remove the [REDACTED] were the only other credited IROFS.

Regulatory Review

The inspectors reviewed the root causes of the event identified by the Root Cause Evaluation team. The inspectors concluded that the failure to establish test acceptance criteria most directly contributed to the event. Without test acceptance criteria, the weekly testing was subject to the operator's judgement as to whether the valve opened properly. In addition, without acceptance criteria, valve response time trending could not be performed which could have identified the degraded performance of the valve prior to failure. Also, the valve had a history of degraded performance unique to this tank (which had prompted the November 2006 [REDACTED] replacement) and trending would have been an appropriate means to verify the effectiveness of the replacement [REDACTED] material. The inspectors noted that the team identified this condition and corrected it with Revision 41 to OP 0021001. The inspectors reviewed the revised OP with an operator and noted that test acceptance criteria had been established and test data were now being recorded and trended by the responsible engineer.

The Root Cause Evaluation team also identified that the November 2006 valve bladder replacement had been performed based on a "like-kind" assessment in accordance with Quality Work Instruction (QWI) 5.1.12, "Change Management," and was installed using Work Order (WO) 20015035. The WO process lacked the more rigorous review required of a facility modification. Additionally, License Application (LA) Section 11.1.3, "Change Control," required that changes to IROFS be evaluated and approved in accordance with the licensee's change control process. A more rigorous review may have identified the air supply pressure setting or established an acceptance criteria. The licensee committed in their 30-Day Written Report for Event Notification 43330, letter dated May 30, 2007, to ensure that modifications to IROFS were implemented through a rigorous change management tool. Since the significance of the event was low, and the licensee took effective corrective action to prevent recurrence, 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 Manual (NCV 70-27/2007-04-01, Failure to Implement the Proper Change Management Process for Modification to an Item Relied On For Safety).

The inspectors identified that nuclear criticality safety (NCS) engineers only learned of the IROFS test failure when requested a few hours later to authorize a WO for removal of the failed valve. The inspectors questioned the processing area foreman who indicated he had not notified NCS. LA Section 11.2.1, "Surveillance Monitoring and Functional Testing," required immediate notification of safety management upon an IROFS test failure. Likewise, OP 0021001 required notification of the NCS manager. Failure to notify the NCS manager was a violation (VIO) of the Operating Procedure reporting requirements (VIO 70-27/2007-04-02, Failure to Immediately Notify Safety Management Following a Test Failure of an IROFS).

(2) Conclusions

On April 30, 2007, an [REDACTED] valve, designated as an IROFS, failed its weekly surveillance test. The root cause investigation team identified several causes and implemented appropriate CAs.

An NCV was identified when a [REDACTED] valve, classified as an IROFS, was modified using a work order process rather than the change management process as specified in LA, Section 11.1.3.

A violation was identified when safety management was not notified of the surveillance test failure of the [REDACTED] valve, classified as an IROFS, as required by LA, Section 11.2.1 and OP 0021001.

b. Lightning Strike Disabled Criticality Monitoring System Detectors

(1) Inspection Scope and Observations

On June 25, 2007, at approximately 11:30 p.m., during a lightning storm, four (4) Criticality Monitoring System (CMS) detectors located at the Waste Treatment (WT) facility alarmed upscale and would not reset. Radiation Protection (RP) technicians had already been monitoring the CMS and had bypassed the automatic howler function consistent with the "storm watch" provisions of procedure RP-07-28. An emergency team member, who had been assigned to monitor radiation levels at the WT facility with a hand-held survey meter during the storm, confirmed that no change in radiation levels had occurred. The WT facility remained under manual radiation monitoring until the detectors were replaced at approximately 2:50 a.m.

(2) Conclusions

On June 25, 2007, RP staff properly responded during a severe electrical storm which caused four (4) CMS detectors to fail upscale and alarm. Storm watch provisions were enacted and manual radiological monitoring was performed until the CMS detectors were replaced.

3. Radiation Protection (IP 88135)

a. Radioactive Source Removal

(1) Inspection Scope and Observations

The inspectors observed operators remove radioactive sources from well counters in UR on June 11. The work was done in accordance with the requirements listed in Radiation Work Permit (RWP) 07-0037. The area was properly posted and the sources were handled safely.

(2) Conclusions

Radioactive sources were properly handled during replacement activities.

b. [REDACTED]

(1) Inspection Scope and Observations

The inspectors observed workers [REDACTED] radioactive waste drum involved in the May 8, 2007, [REDACTED] fire in order to investigate the cause. The work was done safely and in accordance with the requirements of RWP 07-0029. Radiation protection requirements designated in the RWP were appropriate.

(2) Conclusions

radioactive waste drum was performed safely and in accordance with the radiation protection requirements specified in the RWP.

4. Emergency Preparedness (IP 88051)

a. Evaluation of Exercises and Drills (F4)

(1) Inspection Scope and Observations

Section 4.3 of the Emergency Plan required that an emergency exercise be conducted. The exercise was conducted on , in fulfillment of Section 4.3 of the Plan. The licensee submitted in advance of the exercise date the final details on the exercise scenario, scope, and objectives for NRC review. The scenario, associated messages, and field props, provided sufficient details for the exercise participants to demonstrate that the onsite response capability was maintained in a state of readiness for responding to various site postulated accidents. The licensee's performance in the implementation of the Emergency Plan in response to the simulated emergency and the critique to self identify areas of improvement were evaluated. The inspectors observed the licensee's response to the simulated emergency at the incident scene, the On-Scene Command Post, and the Emergency Operations Center.

The exercise scenario simulated . The use of props at the incident scene enhanced the training experience for responders.

Offsite exercise observers and participants included . The licensee's response to mitigate the postulated accident was considered successful. The emergency classification was timely, notifications to offsite authorities were initiated within the required time limits, and the appropriate onsite protective actions recommendations (PARs) were implemented. Although the offsite notifications were initiated in a timely manner, the inspectors noted that the emergency information that was reviewed and approved by the Emergency Director was not actually being conveyed. The communicator notified the offsite agencies that an emergency drill was being conducted but simulated providing the emergency information to offsite contacts. Other examples of simulations were observed by the inspectors and determined to reduce the amount of free play activity to allow execution to occur as it would during an actual event and/or for evaluating the adequacy of the response or areas needing improvement or procedural changes. In addition to excessive simulations, the inspectors discussed the lack

the incident area during the initial response and the exercise command and control as areas for improvements. In response to the areas needing improvement, the licensee indicated that future [REDACTED] NRC graded exercises will limit simulations to ensure that the response and conditions are as close to actual as possible.

The licensee conducted a critique following the exercise which afforded players, controllers, evaluators, and observers an opportunity to provide comments. The critique was an adequate assessment of the response and items were identified by the licensee for program improvement or corrective actions.

(2) Conclusions

The licensee's response to mitigate the postulated accident was considered successful. The scenario details were adequate for evaluating the onsite response capability and the state of readiness for responding to incidents. The critique was an adequate assessment of the response and items were identified for program improvement or corrective actions.

b. [REDACTED] Site Evacuation Drill

(1) Inspection Scope and Observations

Section 4.3 of the Emergency Plan required an [REDACTED] site evacuation drill. The inspectors observed the [REDACTED] site evacuation drill performed on [REDACTED]. The entire facility was evacuated safely. Posted egress routes were unobstructed and sufficiently sized to allow site evacuation and personnel accountability to be completed within approximately [REDACTED] minutes.

(2) Conclusions

The licensee demonstrated a safe and effective site evacuation during the performance of their [REDACTED] evacuation drill on [REDACTED].

5. Exit Meeting

The inspection scope and results were summarized on June 14, and July 12, 2007, with R. Cochrane, General Manager, and other members of the licensee's staff. Although proprietary information and processes were reviewed during this inspection, proprietary information was not included in this report. No dissenting comments were received from the licensee.

[REDACTED]

ATTACHMENT

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, 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>
70-27/2007-04-01	Opened/Closed	NCV - Failure to Implement the Proper Change Management Process for a Modification to an IROFS (Paragraph 2.a).
70-27/2007-04-02	Opened	VIO - Failure to Immediately Notify Safety Management Following a Test Failure of an IROFS (Paragraph 2.a).

3. **INSPECTION PROCEDURES USED**

IP 88135	Resident Inspection Program for Category I Fuel Cycle Facilities
IP 88051	Evaluation of Exercises and Drills

