



UNITED STATES  
NUCLEAR REGULATORY COMMISSION

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

May 23, 2006

EA-06-018  
Event Nos. 42133, 42131, 42089

Mr. D. B. Ferguson  
President & CEO  
Nuclear Fuel Services, Inc.  
P. O. Box 337, MS 123  
Erwin, TN 37650

SUBJECT: NRC INSPECTION REPORT NO. 70-143/2006-003 AND NOTICE OF VIOLATION

Dear Mr. Ferguson:

This refers to the inspection conducted from March 19, 2006, through April 29, 2006, at your Erwin facility. The purpose of the inspection was to determine whether activities authorized by the license were conducted safely and in accordance with NRC requirements.

Areas examined during the inspection included the following: Plant Operations, Management Organization and Controls, Radiation Protection, and Maintenance Surveillance. 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. The current Enforcement Policy is available on the NRC's Web site at [www.nrc.gov](http://www.nrc.gov). The violation is cited in the enclosed Notice of Violation (Notice) and is being cited in the Notice because it was identified by the NRC.

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 RELATING 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]

If you contest the violation, 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.

By letter dated April 4, 2006, we received your reply to our Notice of Violation which was issued on March 6, 2006. The reply met the requirements of 10 CFR 2.201 and your corrective actions will be reviewed during a future inspection.

This letter and the enclosed report contain sensitive unclassified information and will not be available for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). 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. 70-143  
License No. SNM-124

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

cc w/encls:  
B. Marie Moore  
Vice President  
Safety and Regulatory Management  
Nuclear Fuel Services, Inc.  
P. O. Box 337, MS 123  
Erwin, TN 37650


L. Edward Nanney, Director  
Division of Radiological Health  
Tennessee Dept. of Environment & Conservation  
L&C Annex, Third Floor  
401 Church Street  
Nashville, TN 37243-1532

Distribution w/encls: (See page 3)

[REDACTED]

Distribution w/encls:

D. Ayres, RII  
B. Bonser, RII  
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[REDACTED]

## NOTICE OF VIOLATION

Nuclear Fuel Services, Inc.  
Erwin, Tennessee

Docket No. 70-143  
License No. SNM-124

During an NRC inspection conducted from March 19, 2006, through April 29, 2006, a violation of NRC requirements was identified. In accordance with the NRC Enforcement Policy, the violation is listed below:

Safety Condition S-1 of Special Nuclear Materials License No. SNM-124, authorizes the use of licensed materials in accordance with the statements, representations, and conditions in the License Application and Supplements.

Section 2.7 of the License Application, "Procedures," requires SNM operations and safety function activities to be conducted in accordance with written procedures.

Procedure NFS-HS-CL-26, "Nuclear Criticality Safety for the BLEU Preparation Facility," Revision 3, Section 4.6.3, requires containers in the HEU side of Building 333 and outside of process enclosures to be closed while unattended.

Contrary to the above, on April 11, 2006, a container in the HEU side of Building 333 and outside of process enclosures was open while unattended. Specifically, an open two-liter bottle was found in the Solvent Extraction room of the BLEU Preparation Facility.

This is a Severity Level IV violation (Supplement VI).

Pursuant to the provisions of 10 CFR 2.201, Nuclear Fuel Services, Inc. is hereby required to submit a written statement or explanation to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, D.C. 20555 with a copy to the Regional Administrator, Region II, and a copy to the NRC Senior Resident Inspector at the facility that is the subject of this Notice, 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 for each violation: (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 should not be modified, suspended, or revoked, or why such other action as may be proper should not be taken. Where good cause is shown, consideration will be given to extending the response time.

Enclosure 1

[REDACTED]

NOV

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[REDACTED]

If you contest this enforcement action, you should also provide a copy of your response to the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, D.C. 20555-0001.

Your response will be considered sensitive information and will not be made available for public inspection in the NRC Public Document Room or in the NRC's document system (ADAMS).

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

Dated this 23 day of May, 2006

[REDACTED]

[REDACTED]

U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.: 70-143

License No.: SNM-124

Report No.: 70-143/2006-003

Licensee: Nuclear Fuel Services, Inc.


Facility: Erwin Facility

Location: Erwin, TN 37650

Dates: March 19, 2006 - April 29, 2006

Inspectors: S. Burris, Senior Resident Inspector  
D. Rich, Senior Resident Inspector  
R. Gibson, Health Physicist  
W. Britz, Fuel Facilities Inspector

Approved by: D. Ayres, Chief  
Fuel Facility Inspection Branch 1  
Division of Fuel Facility Inspection



## EXECUTIVE SUMMARY

Nuclear Fuel Services, Inc.  
NRC Inspection Report 70-143/2006-003

This inspection included 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. A specialized inspection and review of documentation was conducted by regional inspectors in the areas of Radiation Protection and Maintenance and Surveillance.

### Plant Operations

- A violation was identified when an open, unattended container was found in Building 333 contrary to criticality safety requirements (Paragraph 2.a).
- Items relied on for safety reviewed in the uranium recovery area were available to provide their intended safety function (Paragraph 2.b).
- The licensee had obtained the proper authorizations for the modifications in the solvent extraction area (Paragraph 2.b).

### Management Organization and Controls

- Recent management changes were consistent with license requirements (Paragraph 3).

### Radiation Protection


- Radiation protection and waste management activities were performed safely and in accordance with approved procedures (Paragraph 4).

### Maintenance and Surveillance

- Safety related equipment surveillance tests were performed in accordance with approved procedures (Paragraph 5).

### Attachment:

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



[REDACTED]

## REPORT DETAILS

### 1. Summary of Plant Status

The fuel manufacturing and scrap recovery processes operated throughout the reporting period. Blended low-enriched uranium (BLEU) oxide conversion operations continued, while the BLEU preparation facility (BPF) operations were shutdown following the March 6, 2006, spill. Efforts continued in decommissioning, including processing, packaging, and shipping contaminated soil and debris from burial grounds.

### 2. Plant Operations (Temporary Instruction (TI) 2600/006, Inspection Procedure (IP) 88020)

#### a. Routine Observations, Plant Activities (O3.03); Operating Procedures (O3.06); NCS Training (O3.08)

#### (1) Inspection Scope and Observations

The inspector observed routine operations in fuel process areas, building 333, the Oxide Conversion Building (OCB), and the BPF during normal and off-normal operating shifts to evaluate plant safety and compliance with license requirements.

The inspector reviewed modifications and movement associated with Solvent Extraction (SX) equipment (glovebox). These assessments included review of the movement of the unused glovebox from the solvent extraction room to its new location in the chimney area. Relevant changes on the piping and instrumentation diagrams (P&IDs), changes to items relied on for safety (IROFS), piping modifications, installation and/or replacement of instrumentation were performed properly.

During a tour of the solvent extraction room on April 11, 2006, the resident inspector found a two-liter bottle setting under the stairs, leading to the second story of the building. The bottle contained what appeared to be cheese cloth and did not have a cap as required by procedure for unattended containers. The inspector notified the BPF supervisor, who logged the issue into the licensee's problem identification, resolution, and corrective action system (PIRCS), #7690.

Procedure NFS-HS-CL-26, "Nuclear Criticality Safety for the BLEU Preparation Facility", Section 4.6.3 requires "all containers in the HEU side of Building 333 outside of process enclosures shall be closed while unattended." Failure to ensure that an unattended container was properly sealed/closed, in accordance with procedure NFS-HS-CL-26, was cited as a violation (VIO) of NRC requirements (VIO 70-143/2006-003-01).

[REDACTED]



(2) Conclusions

A violation was identified when an open unattended container was found in Building 333 contrary to criticality safety requirements.

b. Safety Function (O3.02); Maintenance for Safety Controls (O3.07) 03.07, Configuration Control (03.04), and Change Control (03.05)

(1) Inspection Scope and Observations

The inspector reviewed a sample of the IROFS listed in the Integrated Safety Analysis (ISA) for the uranium recovery area and concluded that the IROFS identified were available and reliable to perform their safety function. The inspector reviewed the change control form for the recent modifications to the solvent extraction area. The inspector noted that all the approvals were obtained prior to starting the equipment with special nuclear material.

(2) Conclusions

IROFS reviewed in uranium recovery area were available to provide their intended safety function. The licensee had obtained the proper authorizations for the modifications in the solvent extraction area.

c. Followup on Previous Events

(1) Inspection Scope and Observations

(a) (Closed) Apparent Violation (AV) 70-143-2005-010-02: NRC communicated to the licensee by letter dated April 21, 2006, that AV 70-143-2005-010-02 (involving improperly designed uranium aluminum process overflows, Event No. 42133) was a Severity Level III violation. Therefore, AV 70-143/2005-010-02 is now considered closed and VIO 70-143/2006-003-02 is opened for additional NRC followup and corrective action review (EA-06-018).

(b) The inspectors reviewed Event No. 42131 concerning the failure of an Administrative IROFS in the Environmental Safety Program. On November 8, 2005, in the Building 330 Waste Water Treatment Facility (WWTF), a caustic solution transfer was made from tank 13 to tank 11, and the mass limit was exceeded for uranium. The event was reported in the licensee's Problem Identification, Resolution, and Corrective System (PIRCS). The licensee's initial corrective actions were to reinforce the importance for strict compliance with procedural guidance and review applicable IROFS. In addition, new IROFS limits were revised and implemented to establish consistent limits. Based on this review, this event was closed.

- (c) The inspectors reviewed Event No. 42089 concerning the failure of an Administrative IROFS, where following the transfer of the H caustic discard bank, the block and bleed valves were left open and not locked as required by procedure. As a result, approximately 270 liters of unsampled caustic discard solution from the H bank was transferred to the caustic discard tank immediately following a transfer of sampled solution from the G bank. The event was reported in the licensee's PIRCS. The licensee's immediate corrective actions were to close and lock the block and bleed valves on both the G-Bank and H-Bank, and tag the banks out. Transfer of caustic solutions now must be made with the approval of the facility manager, operator and supervisor, each of which must sign and date that the block and bleed valves are closed prior to transfer and again after a transfer. Based on this review, this event was closed.

(2) Conclusions

The licensee adequately addressed the reportable events to prevent reoccurrence.

3. **Management Organization and Controls (IP 88005, O5)**

a. Organizational Structure (O5.01), Procedure Controls (O5.02)

The inspector reviewed changes in senior management roles, responsibilities and functions that will become effective on May 1, 2006. The Chief Executive Officer assumed the responsibilities of the president and plant manager with the former president being named as Executive Vice President for Site Services. The inspector interviewed licensee personnel affected by these changes and verified that all of the personnel interviewed understood the new reporting and functional responsibilities.

b. Conclusions

Recent management changes were consistent with license requirements.

4. **Radiation Protection (TI 2600/006, IP 83822)**

a. Inspection Scope and Observations

The inspection identified the following aspects of the licensee programs as outlined below:

BLEU Project

The BPF was not operating during the inspection, however routine health physics surveys were being performed. The OCB was operating and the radiation protection program was being implemented in accordance with regulations and license commitments.

Several process parameters and equipment improvements had been made to reduce leakages and thus reduce radiological exposures to keep occupational doses as low as reasonably achievable (ALARA) in the OCB. Internal and external exposures were less than the occupational limits in 10 CFR 20.1201.

Instruments and respiratory protection equipment were maintained as required for worker use. Radiation Work Permits (RWPs) and surveys were posted and being maintained and performed as required. Contamination limits were maintained according to procedural requirements.

#### Low-Level Radioactive Waste Storage

Low-level radioactive waste storage, access, security, arrays, postings, packaging and labeling in the storage building and in the plant areas were adequate. NFS had an effort under way to reduce the waste stored outside and in the low-level radioactive waste storage building. No issues were noted.

#### Radioactive Waste Generator Requirements

Management controls and quality assurance/quality controls and reports for processing radioactive waste were reviewed and found to be adequate. Radioactive waste characterizations, classifications and scaling factors were being performed and documented. Waste shipment records, manifests, and forms 540, 541 and 740 were on file and complete as required by procedure.

The generation and processing of waste in selected buildings and the quantity determination in the VAGAS monitoring system were reviewed and found to be adequate.

#### Waste Management - NFS and BLEU

The licensee effectively maintained liquid effluent concentrations below the limits specified in the license and 10 CFR Part 20.

The gaseous effluent monitoring program was effective in controlling and measuring effluents, and compliant with the requirements of the license. The effluent air sampling equipment, including the sample delivery lines, had been properly maintained. Calculated offsite doses were well below regulatory limits.

#### b. Conclusions

Radiation protection and waste management activities were performed safely and in accordance with approved procedures.

5. Maintenance and Surveillance (88025)

a. Surveillance Testing (F1.06)

The inspector verified selected safety related equipment (SRE) test records for safety controls in the buildings 302, 303, and 304 to verify that they were performed at the required frequency. The inspector also verified that the combustible gas detection system was calibrated. No issues were noted.

The inspector observed licensee personnel perform a functional test on a criticality alarm system for buildings 110, 200, 301, 302, 304, 306 TVA North/South and East/West, and 311. The inspector noted that the licensee personnel followed the proper procedure (NFS-HS-A-21, Operation and Testing of the Criticality, Fire and CO<sub>2</sub> Alarm Systems, Rev. 24) process to assess the system. The inspector also reviewed select test instructions and noted the appropriate amount of detail to perform the test. No issues were noted.

b. Conclusions

SRE surveillance tests were performed in accordance with approved procedures.

6. Exit Meeting

The inspection scope and results were presented to members of the licensee management at various meetings throughout the inspection period and were summarized on May 1, 2006. No dissenting comments were received from the licensee.

**ATTACHMENT**

**1. PERSONS CONTACTED**

Partial List of Licensee's Persons Contacted


D. Brown, President, Epithermal  
K. Crutcher, Analytical Services Manager  
D. Culberson, Acting Licensing Manager  
R. Droke, Licensing & Compliance Director/Acting Safety Director  
M. Moore, Vice President, Safety & Regulatory  
J. Nagy, Senior License & Regulatory Compliance Officer  
J. Parker, Industrial Safety Manager  
K. Schutt, Senior Vice President  
R. Shackelford, Nuclear Criticality Safety Manager  
T. Sheehan, Director HEUO  
J. Stout, Security Director  
M. Tester, Senior Manager, Radiation Control  
J. Wheeler, ISA Manager

**2. INSPECTION PROCEDURES USED**

TI 2600/006 Safety Operations, Safeguards, Radiological Controls & Facility Support  
IP 83822 Radiation Protection  
IP 88005 Management Organization and Controls  
IP 88020 Regional Criticality Safety Inspection Program  
IP 88025 Maintenance and Surveillance  
IP 84850 Inspection of Waste Generator Requirements of 10 CFR Part 20 and  
10 CFR Part 61  
IP 84900 Low Level Radioactive Waste Storage

**3. LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED**

<u>Item Number</u>	<u>Status</u>	<u>Type</u>	<u>Description</u>
70-143/2006-003-01	Open	VIO	Failure to follow criticality safety procedures (paragraph 2.a)



70-143/2006-003-02	Open	VIO	Violation A was a failure to develop and implement a design for the uranium-aluminum enclosure overflow system would be reliable and available to perform their function when needed. Violation B was a failure to report a condition that resulted in the facility not being able to meet the requirements of 10 CFR 70.61. This item is being opened as a mechanism to track closure of a previously identified and closed Apparent Violation (EA-06-018).
70-143/2005-010-02	Closed	AV	Violation A was a failure to properly design the enclosure overflow system. Violation B was a failure to report this design deficiency condition (EA-06-018).

