UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
245 PEACHTREE CENTER AVENUE, SUITE 1200
ATLANTA, GEORGIA 30303-1257

April 28, 2010

NMED No. 100039
NRC Event No. 45462

Mr. David B. Amerine
President
Nuclear Fuel Services, Inc.
P. O. Box 337, MS 123
Erwin, TN 37650

SUBJECT: NRC INSPECTION REPORT NO. 70-143/2010-001

Dear Mr. Amerine:

This letter refers to the inspections conducted from January 1, 2010 to March 31, 2010, at the Nuclear Fuel Services (NFS) facility in Erwin, TN. The results of the safeguards portion of the inspection will be transmitted in a separate cover letter. The purpose of these inspections was to determine whether activities authorized under the license were conducted safely and in accordance with NRC requirements. At the conclusion of the inspections, the findings were discussed on April 1, 2010, with those members of your staff identified in the enclosed report.

The inspections consisted of an examination of activities conducted under the license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of the license. Areas examined during the inspections are identified in the enclosed report. Within these areas, the inspections consisted of a selective examination of procedures and representative records, observations of activities in progress, and interviews with personnel.

Based on the results of these inspections, no cited violations or deviations were identified.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its 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/reading-rm/adams.html.

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

Sincerely,

/RA/

Steven J. Vias, Chief
Fuel Facility Inspection Branch 1
Division of Fuel Facility Inspection

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

Enclosure: NRC Inspection Report No. 70-143/2010-001

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X PUBLICLY AVAILABLE ☐ NON-PUBLICLY AVAILABLE ☐ SENSITIVE **X** NON-SENSITIVE

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OFFICE	RII:DFFI	RII:DFFI	RII:DFFI	RII:DFFI	RII:DFFI	RII:DFFI
SIGNATURE	Via email 4/28	Via email 4/28	MC 4/28/10			
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DATE	4/ /2010	4/ /2010	4/ /2010	4/ /2010	4/ /2010	4/ /2010
E-MAIL COPY?	YES NO	YES NO	YES NO	YES NO	YES **X**NO	YES NO

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U. S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.:	70-143
License No.:	SNM-124
Report No.:	70-143/2010-001
Licensee:	Nuclear Fuel Services, Inc.
Facility:	Erwin Facility
Location:	Erwin, TN 37650
Dates:	January 1, 2010 – March 31, 2010
Inspectors:	G. Smith, Senior Resident Inspector M. Chitty, Resident Inspector
Approved by:	S. Vias, Chief Fuel Facility Inspection Branch 1 Division of Fuel Facility Inspection

Enclosure

EXECUTIVE SUMMARY

Nuclear Fuel Services, Inc.
NRC Inspection Report 70-143/2010-001

This inspection included activities conducted by resident inspectors during normal and off normal shifts in the areas of safety operations, radiological controls, facility support, and safeguards.

Safety Operations

- The licensee maintained the facility in a safe configuration and in accordance with the license requirements and the ISA. (Paragraph 2.a)
- Criticality station limit cards were followed by licensee personnel. (Paragraph 2.b)
- Transient combustibles were controlled and minimized. (Paragraph 2.c)

Radiological Controls

- Radiation work permits were adequately developed and implemented in order to ensure personnel exposure kept as low as reasonably achievable. (Paragraph 3)

Facility Support

- Adverse conditions were sufficiently identified and tracked to completion. (Paragraph 4)

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

REPORT DETAILS

1. Summary of Plant Status

The facility began the period with all operating areas shutdown as part of an extended shutdown period in order to make necessary safety improvements to the facility. The shutdown included the Naval fuel manufacturing facility (FMF), the Blended Low Enriched Uranium (BLEU) Preparation Facility, and the Commercial Development (CD) line. This action was addressed in a December 30, 2009 letter from NFS to the NRC. On January 7, 2010, the NRC issued a Confirmatory Action Letter (CAL) to NFS delineating several actions to be completed prior to restart of the facility. On February 9, 2010, NFS notified the NRC that they were ready for the NRC to verify completion of the CAL items. On February 22, 2010, the NRC assembled a restart Readiness Assessment Team to evaluate the status of the NFS facility to operate in a safe and secure manner. This effort will be documented in inspection report 70-143/2010-005. Following completion of the NRC's restart readiness assessment, authorization was given to NFS to start up the Naval FMF on March 23, 2010. The first lot of Special Nuclear Material (SNM) was introduced into area 900 on March 30, 2010. At the completion of the inspection period on March 31, only Areas 900 and 'C' were in operation at the facility.

2. Safety Operations

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

(1) Inspection Scope and Observations

Operating Area Observations

The inspectors performed daily tours of production areas and determined that equipment and systems were in compliance with the license. Daily status meetings were observed throughout the period where commitment status and issues were discussed. The inspectors reviewed selected licensee identified events and corrective actions for previously identified events and found no significant deficiencies in the items reviewed. The inspectors focused on safety related equipment (valves, sensors, instrumentation, in-line monitors, scales, etc) and items relied on for safety (IROFS).

The daily tours included walkdowns of the BLEU Preparation Facility (BPF), FMF, storage areas, vaults, and the waste treatment facility. The inspectors verified that there was adequate staffing and that operators were attentive to their duties, including the status of various alarms and annunciators. The inspectors also verified that activities, normal and abnormal, were performed in compliance with procedures and station limits, and that safety controls were in place and were being controlled with supervision. The inspectors verified the adequacy of communications between supervisors and operators within the production areas. The inspectors walked down sections of the standard operating procedures and verified that IROFS were identified and operable in each of the areas. The inspectors reviewed log books, lockout/tagout records, and Letters of Authorization (i.e. temporary procedures) to obtain information concerning trends and activities. The inspectors verified the licensee was actively pursuing corrective action for

conditions requiring temporary modifications as well as any prescribed compensatory measures.

Plant Tours

The inspectors performed periodic tours of the out-lying facility areas during the inspection period and determined that equipment and systems were operated safely and in compliance with the license. The focus of these tours centered around the evaluation of potential missile hazards and missile protection features, combustible material storage and fire loading, hazardous chemical storage, adequate storage of compressed gas containers, potential degradation of plant security features, and potential fire hazards. During these tours, the inspectors also verified that the required notices to workers were appropriately and conspicuously posted in accordance with 10 CFR 19.11.

Plan-of-the-Day-Meeting.

The inspectors attended various plan-of the-day meetings throughout the inspection period in order to determine the overall status of the plant. The inspectors evaluated the adequacy of the licensee's response to significant plant issues as well as the licensee's approach to solving various plant problems.

Safety-Significant System Walkdown

During the inspection period, the inspectors performed a walkdown of the below listed safety significant systems involved with the processing of licensed nuclear material:

- CD line ventilation system
- Area LA

As part of these system evaluations, the inspectors reviewed the ISA for each system in order to identify assumptions and controls. The inspectors verified that these assumptions and controls were properly implemented in the field. During the walkdown, the inspectors verified that the as-built configuration matched the approved plant drawings. The inspectors also interviewed operators in order to ensure that plant personnel were familiar with the assumptions and controls associated with these systems as well as the items relied on for safety (IROFS) and IROFS instrumentation for maintaining plant safety. Specifically, the inspectors verified correct valve and switch position alignments as required by procedure, the absence of conditions that may degrade plant performance as well as the operability of IROFS, safety-related devices, and support systems essential to safety system performance.

(2) Conclusions

No findings of significance were identified.

b. Criticality Safety (IP 88135)

(1) Inspection Scope and Observations

During daily production area tours, the inspectors verified various criticality controls to be in place. The station limit card requirements were observed by personnel. Containers were adequately controlled in order to minimize criticality hazards. The inspectors

sampled a number of criticality-related IROFS to verify their operability. Operators were knowledgeable of the IROFS' requirements. These IROFS were adequately identified in the field as well as on plant controlled drawings.

(2) Conclusions

No findings of significance were identified.

c. Fire Protection (IP 88135)

(1) Inspection Scope and Observations

During daily plant tours, the inspectors verified that transient combustibles were being adequately controlled and minimized and that fire barriers located between fire areas were being properly maintained.

The inspectors conducted a fire safety tour of building 304. The inspectors verified adequate control of combustible materials. The inspectors walked down various fire suppression components and systems that supplied building 304 and verified these systems were properly aligned and operational. The inspectors verified that various aspects of the fire protection/prevention strategies conformed to the applicable nuclear criticality safety evaluation.

The inspectors performed a review of actions taken by the licensee with respect to fire protection measures associated with the storage of uranium hexafluoride (UF_6) cylinders (see paragraph 5). Inspectors performed walkdowns of the areas used for cylinder storage. Particular attention was given to the automatic and manual methods, including the fire extinguishing mediums, in place for extinguishing fires internal and external to the UF_6 cylinder storage areas. Inspectors also reviewed the fire protection plan and monitored fire brigade training specific to fighting fires in UF_6 cylinder storage areas.

(2) Conclusions

No findings of significance were identified.

3. Radiological Controls

Radiation Protection (IP 88135)

(1) Inspection Scope and Observations

During various tours of the production areas, the inspectors verified workers complied with health physics procedures. The inspectors noted that plant workers properly wore dosimetry, used protective clothing in accordance with applicable Radiological Work Permits (RWPs), and properly frisked upon exiting the controlled area. The inspectors verified radiation areas were properly posted and that radiation maps included up-to-date radiation levels. The inspectors also verified the operation of radiation protection instruments as well as their calibration frequencies.

The inspectors performed a detailed review of a standard Safety Work Permit (SWP) #10-04-005. This SWP included radiological requirements detailed under the RWP section. The work involved replacing three dampers in Area 'D' located within building 302. The work was performed under work requests #139294, #139295, and #139296. The inspectors verified that craft personnel complied with the prescribed controls and precautions. The inspectors noted that the RWP contained adequate requirements concerning the radiation levels, respiratory equipment, dosimetry, contamination levels, special tools and equipment, airborne radioactivity, and containment devices. The area was effectively controlled by health physics personnel. The SWP was prominently posted for employees' review and observation. Workers entering the SWP area signed onto the SWP, verifying their knowledge of the entry requirements

(2) Conclusions

No findings of significance were identified.

4. Facility Support

Management Organization and Controls (IP 88135)

(1) Inspection Scope and Observations

The inspectors performed daily reviews of the licensee's Problem Identification, Resolution and Correction System (PIRCS) entries to ensure that items adverse to requirements and safety were being identified and tracked to closure. The inspectors verified that issues were being properly identified, reviewed and tracked to completion.

The inspectors reviewed management organization changes since the last inspection. Significant management changes included a new President and a nuclear safety and licensing manager. The inspectors interviewed the new managers and determined that they were knowledgeable of their functions, responsibilities, and recognized their responsibility for security and safety. The inspectors also reviewed the qualifications of the new leadership.

(2) Conclusions

No findings of significance were identified.

5. Follow-up on Events (88135)

(1) Inspection Scope and Observations

The inspectors reviewed Event No. 45462 concerning potentially over-pressurized UF_6 cylinders. On November 13, 2009, a fire in the CD line occurred as a result of the presence of fluorine gas in the vapor space of a UF_6 cylinder, which was in the process of being sublimated. The NRC subsequently issued VIO 70-143/2009-004-001 for the failure to properly account for the presence of fluorine gas in the design of the sublimation station. The inspectors performed a review of the licensee's analysis of all the stored UF_6 cylinders (1S/2S, 5A and hoke tubes) on site and the estimated internal pressures of the cylinders with respect to the service pressure of 200 psi as well as the

hydrostatic test pressure of 400 psi. Inspectors noted that NFS' initial pressure calculations were conservatively high which caused the licensee to report this condition to the NRC. NFS immediately instituted several compensatory measures including the placement of special fire-fighting equipment near the storage areas and restricting access to the affected areas.

Following notification, NFS began an in depth examination of the UF_6 cylinders and the shipping containers in which they are currently housed. This review concluded that any leakage of fluorine from the cylinders would be consumed by materials in the annulus of the shipping container and thus be contained with only minor leakage beyond the shipping containers. NRC inspectors performed their own calculations and review of this issue and concluded that the likelihood of a fluorine gas release to the environment and the consequence to workers and the public was low. The inspectors determined that the licensee properly identified and implemented compensatory measures.

(2) Conclusions

No findings of significance were identified.

6. Exit Meeting

The inspection scope and results were presented to members of the licensee's staff at various meetings throughout the inspection period and were summarized on April 1, 2010, with the licensee's management. No dissenting comments were received from the licensee. Proprietary information was discussed but not included in the report.

ATTACHMENT

1. PERSONS CONTACTED

Partial List of Licensee's Persons Contacted

T. Lindstrom, Vice President of Operations
M. Moore, Advisor, Safety & Regulatory
J. Nagy, Chief Nuclear Safety Officer
R. Bond, Senior Project Director, HEU Operations
R. Droke, Licensing Director
R. Shackelford, Nuclear Criticality Safety Manager
J. Wheeler, ISA Manager
A. Vaughan, Director Fuel Production

2. INSPECTION PROCEDURE USED

IP 88135 Resident Inspectors Program for Category 1 Fuel Cycle Facilities

3. LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Item Number	Status	Type/Description
70-143/2009-04-01	Discussed	VIO – Inadequate design of a system containing SNM (Paragraph 5)