UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
SAM NUNN ATLANTA FEDERAL CENTER
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ATLANTA, GEORGIA 30303-8931

May 4, 2009

NMED Nos. 090236, 090369, 090380
NRC Event Nos. 44848, 44887, 44890

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

SUBJECT: NRC INSPECTION REPORT NO. 70-143/2009-001

Dear Mr. Kudsin:

This letter refers to the inspection conducted from January 1 through April 4, 2009, at the Nuclear Fuel Services (NFS) facility in Erwin, TN. The purpose of the inspection was to determine whether activities authorized under the license were conducted safely and in accordance with NRC requirements. At the conclusion of the inspection on April 8, 2008, the findings were discussed with those members of your staff identified in the enclosed report.

The inspection 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 inspection are identified in the enclosed report. Within these areas, the inspection consisted of a selective examination of procedures and representative records, observations of activities in progress, and interviews with personnel.

Based on the results of this inspection, no cited violations or deviations were identified. Enclosure 2 of this report contains a synopsis of the Office of Investigations Case Report 2-2008-041 dealing with tampering of two fire alarm horns. The investigation concluded that the alarm horns were willfully tampered with by unidentified individuals. However, the issue was closed as a minor violation based its very low safety significance because the alarm horns were still capable of performing their design function.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, and 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/readingrm/adams.html.

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

Sincerely,

/RA/
D. Charles Payne, Chief
Fuel Facility Inspection Branch 1
Division of Fuel Facility Inspection

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

Enclosures: 1. NRC Inspection Report No. 70-143/2009-001
2. OI Synopsis Case Report 2-2008-041

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U. S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.:	70-143
License No.:	SNM-124
Report No.:	70-143/2009-001
Licensee:	Nuclear Fuel Services, Inc.
Facility:	Erwin Facility
Location:	Erwin, TN 37650
Dates:	January 1 through April 4, 2009
Inspectors:	S. Burris, Senior Resident Inspector G. Smith, Resident Inspector
Approved by:	D. Charles Payne, Chief Fuel Facility Inspection Branch 1 Division of Fuel Facility Inspection

Enclosure 1

EXECUTIVE SUMMARY

Nuclear Fuel Services, Inc.
NRC Inspection Report 70-143/2009-001

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

Safety Operations

- Plant operations activities were performed safely and in accordance with approved procedures. (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

- The inspectors identified one minor violation regarding the implementation of an unapproved plant modification. (Paragraph 4.a)
- Adverse conditions were sufficiently identified and tracked to completion. (Paragraph 4.b)

Safeguards

- Physical Protection elements were carried out in accordance with the security plan. (Paragraph 5)

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

REPORT DETAILS

1. Summary of Plant Status

Fuel manufacturing, training activities, and scrap recovery processes were operated throughout the reporting period. Blended low enriched uranium (BLEU) oxide conversion and BLEU Preparation Facility (BPF) activities operated normally during the inspection period. Decommissioning, including processing, packaging, and shipping contaminated soil and debris from burial grounds continued under normal operations.

2. Safety Operations

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

(1) Inspection Scope and Observations

Operating Area Observations

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

These daily tours included walkdowns of the BPF, Naval fuel process areas, 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 normal and non-routine activities 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 operating 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 modifications) to obtain information concerning operating 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 outlying 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.

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 its approach to solving various plant problems.

Problem Identification Resolution and Correction System (PIRCS) Meeting

The inspectors attended numerous PIRCS meetings throughout the inspection period to stay current with the overall status of plant problems and issues which were identified through the PIRCS process. The inspectors evaluated the adequacy of the licensee's response to significant plant issues as well as the licensee's approach to solving plant problems.

During routine review of daily PIRCS activities, the inspectors noted a problem that had been identified with Maxon (supply) valves in the Hydrogen Detection System for the fuel manufacturing facility (#17944). All of the Maxon valves had tripped closed due to a system perturbation during normal operations of the area, requiring the operators to safely shutdown the process. Over the course of the day, two more PIRCS were generated identifying issues with the testing required to return the Maxon valves to service (#17949 and #17951). Licensee personnel performed an investigation and found that the testing of the valves was not possible with strict compliance with the existing procedure. Subsequently, the licensee modified the testing methodology (via a Letter of Authorization) and successfully tested the equipment. The valves were then returned to safe operation later that day.

Safety-Significant System Walkdown

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

- Area F in Building 302
- Area G & H in Building 333

As part of this system evaluation, the inspectors reviewed the ISA for the 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 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

The licensee operated the facility safely and in accordance with the license requirements and the ISA.

b. Criticality Safety (IP 88135)

(1) Inspection Scope and Observations

The Inspectors toured processing, storage, and recovery areas and observed that personnel complied with approved written nuclear criticality safety (NCS) limits and controls. The inspectors verified NCS limits were posted and available to the operators. Proper spacing practices and controls, use of storage locations, and identification of Special Nuclear Material (SNM) were also observed during tours of the facility. The inspectors sampled a number of criticality-related IROFS to verify their operability. The inspectors interviewed operators and determined that they were knowledgeable of the IROFS' requirements. These IROFS were adequately identified in the field as well as on plant controlled drawings.

(2) Conclusions

Licensee criticality controls were adequately followed by licensee personnel.

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.

(2) Conclusions

Maintenance of fire barriers was adequate and transient combustibles were controlled.

3. Radiological Controls

Radiation Protection (IP 88135)

(1) Inspection Scope and Observations

During various tours of the operating areas, the inspectors observed worker compliance 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 Safety Work Permit (SWP) #09-02-006. This SWP included radiological requirements detailed under the RWP section involving the replacement of two process filters in building 302. The inspectors observed work in progress and 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. The inspectors monitored that workers entering the SWP area had properly signed onto the SWP signifying their understanding of the entry requirements.

(2) Conclusions

Radiation protection practices were performed in accordance with plant procedures and ensured that dose was maintained As Low As Reasonably achievable (ALARA).

4. Facility Support

a. Permanent Plant Modifications (IP 88135)

(1) Inspection Scope and Observations

The inspectors reviewed PIRCS item #13445. This issue dealt with the implementation of an unapproved modification to the facility. Specifically, during maintenance, a fire alarm horn in the Secondary Alarm Station (SAS) was found improperly muted with tissue paper. A similar problem was identified in Central Alarm Station (CAS) when the licensee conducted its extent of condition review. The paper was removed and the licensee implemented various corrective actions including employee training regarding unapproved plant modifications. This issue was the subject of an investigation by the NRC's Office of Investigations (Case Report 2-2008-041). The investigation concluded that the unapproved modification was willfully performed by unidentified individuals. However, the modification did not compromise the safety function of the horns because the modification only reduced the volume of the alarms. Because the modification left the alarms functioning and audible, the licensee's failure to utilize the change control process was of very low safety significance. This failure constitutes a violation of minor significance and is not subject to formal enforcement.

(2) Conclusions

No violations of significance were noted.

b. Management Organization and Controls (IP 88135)

(1) Inspection Scope and Observations

The inspectors performed daily reviews of the licensee's PIRCS entries to ensure that items adverse to requirements and quality were being identified and tracked to closure.

The inspectors evaluated licensee efforts associated with the identification, review and resolution of issues.

(2) Conclusions

The licensee sufficiently documented and corrected adverse conditions.

5. Safeguards

Physical Protection (IP 88135)

(1) Inspection Scope and Observations

During daily plant tours, the inspectors verified that persons within the protected area (PA) properly displayed photo identification and those individuals not possessing unescorted access clearance were properly escorted. During entry and exit from the PA, the inspectors verified that personnel were searched using appropriate search equipment. Additionally during tours of the operating areas, the inspectors verified that the Material Access Area (MAA) portals were effectively controlled

(2) Conclusions

Plant activities were carried out in accordance with the security plan.

6. Follow-up on Events (88135)

(1) Inspection Scope and Observations

The inspectors reviewed Event Notification (EN) No. 44848 concerning a contaminated worker being sent to a medical facility. On February 12, 2009 an operator was changing a filter in a glove box when he noticed liquid on his sleeve. The safety department was notified and the operator was found to be contaminated above the facility limits. Decontamination attempts were unsuccessful due to a nitric acid burn on the operator's forearm. Several small pinholes in the installed glove box glove were identified which allowed the acid to reach the operator's skin. The operator was sent to medical facility for further evaluation. Ultimately, the individual was treated for second degree burns at a local medical facility and released. There were no actual consequences to the public or environment. The operator was using proper Personal Protective Equipment (PPE), namely the installed glove box glove, as well as tight-fitting rubber surgical gloves. The emergency safety shower was available and utilized. The event was correctly reported to the Headquarters Operations Officer (HOO) in a timely manner pursuant to 70.50(b)(3), as an unplanned medical treatment at a medical facility of an individual with spreadable radioactive contamination on the individual's clothing or body. The licensee completed an extent of condition review to verify the condition of gloves in all glove boxes. As a result, some gloves were replaced due to inadequate glove thickness.

The inspectors reviewed EN No. 44887 which involved a failure of a component designated as safety related equipment (SRE). The component is utilized as an IROFS in area F of building 302. The failure was noted during routine SRE testing where the subject IROFS (level switch) failed to fulfill its safety function in securing a pump in the presence of a low fluid level. The licensee determined that the issue fell within the 24-hour reporting requirements for failing to meet the performance criteria of 10 CFR 70.61 as required by 10 CFR Part 70 App A (b) (2)) and notified the HOO on March 3, 2008, at 3:32 p.m. Based on a review of the ISA, the failure resulted in a high consequence event failing to meet the highly unlikely category. The system was shutdown at the time of the failure. The inspectors concluded that the licensee corrective actions were appropriate.

The inspectors reviewed EN No. 44890 involving the potential inadequacies of glove box overflow drains' ability to perform their safety function. The licensee found that some of the calculations for glove boxes drains may not meet the design criteria as specified in the ISA. Specifically, the sizing of the overflows may not accommodate the credible flow rates into the associated glove boxes. To resolve these questions, NFS performed field tests using a glove box on February 26, 2009 and February 27, 2009. Initial results of these tests indicated that the discharge flow rates were sensitive to drain weir height and glove box floor flatness. This caused NFS to question the ability of the drains to perform their intended function. NFS, therefore, generated a plant-wide list of all potentially affected glove boxes and suspended operations in all affected glove boxes on February 27, 2009. Uranium-bearing materials were removed from the glove boxes and all of the affected glove boxes were tagged out of service. Engineering evaluations of the affected glove boxes were performed and preceded through March 4, 2009. As a result of the engineering evaluations, it was determined that in some instances a single drain alone was not capable of maintaining a solution depth to within design parameters in some localized areas within the glove box. Modifications were made to the drains to restore the glove box functionality. On March 4 at 3:18 p.m., the licensee reported this condition to the HOO in accordance with 10CFR70 Appendix A, Section a (5) as a loss of control where only one IROFS remains available to prevent a criticality event. The NRC initiated a Special Inspection Team to review the issue and licensee's follow up evaluation. The results of the assessment are documented in NRC Report 2009-007, dated April 24, 2009 (ADAMS accession number ML091140536).

(2) Conclusions

The above issues were reported in the licensee's PIRCS program. The licensee properly identified and corrected the issues and subsequently determined that these items were reportable as required by 10 CFR Part 70.

7. 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 with yourself and members of your staff on April 8, 2008. 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

D. Kudsin, President
T. Lindstrom, General Manager
M. Moore, Vice President, Safety & Regulatory
J. Pugh, Director Operational Support
R. Bond, Senior Project Director, HEU Operations
R. Droke, Licensing Director
T. Coates, Engineering Section Manager
R. Shackelford, Nuclear Criticality Safety Manager
G. Athon, Vice President, Applied Technology/Principle Scientist
R. Maurer, Criticality Safety Engineer
N. Brown, Criticality Safety Engineer
M. Tester, Sr. Manager, Radiation Control
J. Parker, Industrial Safety Manger
K. Weir, Deputy Security Director
A. Vaughan, Director Fuel Production

2. INSPECTION PROCEDURES USED

IP 88135	Resident Inspectors Program for Category 1 Fuel Cycle Facilities

SYNOPSIS

This investigation was initiated on May 9, 2008, by the U.S. Nuclear Regulatory Commission (NRC), Office of Investigations (OI), Region II (RII), to determine whether during an undetermined time period a contract security officer(s) employed by Murray Guard Corporation, at Nuclear Fuel Services (NFS) or an employee of NFS willfully tampered with the fire alarm annunciation system in the Secondary Alarm Station (SAS).

Additionally, the ensuing investigation obtained information the fire alarm annunciation system in the Central Alarm Station (CAS) was also tampered with.

Based upon the evidence developed, OI:RII substantiated the fire alarm annunciation system in the CAS and SAS were willfully tampered with by unidentified individual(s) who had access to the CAS and SAS fire control panels. The willful violations (not obtaining approval prior to impairing the fire alarm annunciation systems) caused NFS to be in violation of their license requirements.