



UNITED STATES
NUCLEAR REGULATORY COMMISSION

REGION II
SAM NUNN ATLANTA FEDERAL CENTER
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ATLANTA, GEORGIA 30303-8931

November 13, 2006

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

SUBJECT: NRC INSPECTION REPORT NO. 70-143/2006-013

Dear Mr. Ferguson:

This refers to the inspection conducted from September 3, 2006, through October 14, 2006, at the Nuclear Fuel Services 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: Operations, Management Organization and Controls, Radiation Protection, Operator Training/Retraining, and Strike Contingency Plans. 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, violations or deviations were not identified.

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

Enclosure: (See page 2)

D. B. Ferguson, Jr.

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cc w/encl:

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Vice President

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U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.: 70-143

License No.: SNM-124

Report No.: 70-143/2006-013

Licensee: Nuclear Fuel Services, Inc.

Facility: Erwin Facility

Location: Erwin, TN 37650

Dates: September 3, 2006 - October 14, 2006

Inspectors: S. Burris, Senior Resident Inspector
G. Smith, Resident Inspector
M. Crespo, Fuel Facilities Inspector
O. Lopez, Fuel Facilities Inspector
R. Gibson, Health Physicist

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

Enclosure



EXECUTIVE SUMMARY

Nuclear Fuel Services, Inc.
NRC Inspection Report 70-143/2006-013

This inspection included observations conducted by the Resident Inspectors during normal and off-normal shifts in the area of Plant Operations and Strike Contingency Plans. Specialized inspections and reviews of documentation were conducted by regional inspectors in the areas of Radiation Protection, Operator Training/Retraining, and Management Organization and Controls.


Plant Operations

- All of the operations activities observed were performed safely and in accordance with approved procedures (Paragraph 2.a).
- Numerous electrical safety related equipment (SRE) tests in the Naval Fuel Production Area, Blended Low-Enriched Uranium (BLEU) Complex, BLEU Preparation Facility (BPF) were performed to verify that each component would go to its specified safety condition on a loss of power and remain in a safe condition on re-energization. During the testing of these items, the licensee found that one in line monitor at the BLEU Complex would not properly perform its intended safety function as designed (Paragraph 2.b).

Management Organization and Controls

- Limited personnel changes were made during this assessment period and did not appear to impact the responsibilities and functions specified in the license. The licensee's system to review and issue procedures adequately ensured that safety procedures were properly controlled and approved (Paragraph 4.a).
- Reviewed audits were of sufficient depth and appropriately targeted. The results were documented and conveyed to management, and audit findings were resolved in a timely manner. The inspectors determined that the licensee adequately implemented requirements of the Safety & Safeguard Review Council (SSRC) (Paragraph 4.b).

Radiation Protection of the Navy Fuel Process

- The radiation protection program was being implemented in accordance with regulations and license commitments. Self-assessments by the licensee and implementation of the as low as reasonably achievable (ALARA) program were adequate. The licensee's implementation of corrective actions to resolve violations of noncompliance in the area of Radiation Work Permits (RWP) was adequate.
- 

Operator Training/Retraining

- The licensee provided adequate training to its employees in the required areas of radiation protection, criticality safety, emergency preparedness, procedure adherence, and general employee training. The training observed showed that the employees had a good understanding of the fuel processes (Paragraph 6.a).

Strike Contingency Plan


- The licensee strike contingency plan is in place and continued security operations for the on-going strike appeared to be adequate (Paragraph 7.a).

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, and scrap recovery processes were operated, and training activities were conducted throughout the reporting period. Blended low-enriched uranium (BLEU) oxide conversion activities operated normally during the inspection period. BLEU Preparation Facility (BPF) operations had been shut down since the March 6, 2006, spill event. NRC performed the final review of BPF during the week of October 8, 2006 (results documented in NRC Inspection Report 2006-019). Decommissioning, including processing, packaging, and shipping of contaminated soil and debris from burial grounds, has been stopped due to staffing issues resulting from the union strike.

2. Plant Operations (Inspection Procedures (IPs) 88020, 88135)


a. Routine Observations, Plant Activities (03.03); Operating Procedures (03.06); NCS Training (03.08)

(1) Inspection Scope and Observations

The inspectors performed numerous walkdowns of the fuel process areas, Building 333, the Oxide Conversion Building (OCB), and the BPF. The inspectors verified adequate staffing and evaluated attentiveness of operators in carrying out their assigned duties. Communications were monitored between supervision and line operators. Adequate oversight was provided by supervision. The inspectors verified procedural compliance within the operating areas.

The inspectors reviewed training and operations in the 900 area and verified procedural adherence. The inspectors walked down sections of the standard operating procedures and verified that items relied on for safety (IROFS) were identified and present in the 100, 200, 300, 500, 600, and 800 areas. No issues were noted. The inspectors observed the installation of equipment and testing of smoke detectors in Area L with no issues. However, the inspectors did note a malfunctioning fire door in the entrance to BPF. When informed, the licensee took appropriate compensatory measures via routine fire patrols and initiated a work order to repair the door. The inspectors also reviewed the implementation of the new special work permit system. No issues were noted.

The inspectors toured the BLEU complex and verified that several safety related equipment (SRE) tests were current and being performed in accordance with procedures. The inspectors also reviewed the safety analysis for the uranyl nitrate building (UNB), and were satisfied with the licensee's explanation of the elimination of certain IROFS.



[REDACTED]

The inspectors noted no issues with housekeeping in any of the areas reviewed.

(2) Conclusions

All of the operations activities observed were performed safely and in accordance with approved procedures.

b. Safety Function (03.02); Maintenance for Safety Controls (03.07), Configuration Control (03.04), and Change Control (03.05)

(1) Inspection Scope and Observations

The inspectors observed the resumption of BPF activities for inventory reconciliation after both Phases 1 and 2 authorization letters were issued. These activities included:

- completion of initial recovery actions for special nuclear material (SNM) inventory clean-out and accountability,
- SRE testing for identified BPF components after issuance of Phases 1 and 2 resumption approval,
- verification of training activities (discussed in detail in paragraph 6), and
- verification of facility readiness for resumption after approval to resume operations is granted.

During the Special Team Inspection (SIT) conducted October 9-13, 2006, questions were identified concerning the reliability of IROFS during and after a loss of power. The licensee reviewed the Integrated Safety Analysis (ISA) for all areas of the facility and developed a list of potential Safety Related Equipment (SRE) that could not be verified as having been tested. The licensee immediately developed a plan and commenced testing those SRE which were available to be tested. Numerous SRE tests were performed and verified by the inspectors to ensure IROFS were capable of performing their intended function when the facility was restarted. Some of the items reviewed included: operability of the in-line monitors, waste off gas lines, automatic isolation (shutoff) valves, level detectors, pressure switches, and mass limit safety programmable logic controller (PLC) flow switches.

During the testing of these items, the licensee found that one in-line monitor at the Blended Low Enriched Uranium (BLEU) Complex would not properly perform its intended safety function as designed. The licensee committed to keep this system shutdown until the proper controls could be put in place. All other tests were performed successfully with the exception of those tests which required some form of production operations or addition of material. The licensee committed that these test would be performed as soon as practical.

[REDACTED]

(2) Conclusions

Numerous electrical SRE in the Naval Fuel Production Area, BLEU Complex, BLEU Preparation Facility (BPF) were performed to verify that each component would go to its specified safety condition on a loss of power and remain in a safe condition when re-energized. During the testing of these items, the licensee found that one in line monitor at the BLEU Complex would not properly perform its intended safety function as designed.

3. Temporary Instruction 2600/012:

The inspectors reviewed the following generic safety issues:

- IN-89-003, "Potential Electrical Equipment Problems:" The licensee adequately addressed the potential for electrical problems by designing and installing IROFS that failed safe. The inspectors reviewed diagrams for [REDACTED] in the naval fuel operations and verified that the instruments were set to fail in the appropriate configuration in the event of a loss of power.
- IN-87-033, "Applicability of 10 CFR Part 21 to Non-Licensees:" The only safety grade equipment used by the facility is the safety process logic controller from Siemens. The licensee did not require Siemens to make Part 21 reports; however, the licensee was closely tracking any issues that Siemens found with their equipment.
- IN-86-077, "Computer Program Error Report Handling:" The licensee was on the mailing list for any potential errors discovered by the vendors of the KENO software. The licensee adequately responded to some errors reported last year. No issues were noted.

4. Management Organization and Controls (IP 88005)

a. Organizational Structure (05.01), Procedure Controls (05.02)

(1) Inspection Scope and Observations

The inspectors reviewed limited changes in personnel responsibilities and functions that occurred since the last inspection in order to verify that personnel qualification requirements were met. The inspectors determined that experience and education requirements, as specified in the license, were satisfied.

Through interviews with personnel, observation of on-going activities and discussions with the licensee, the inspectors determined that procedures for operations and safety management systems were reviewed in the appropriate time frame and approved by the appropriate management. The inspectors verified that changes to procedures were

properly reviewed by the appropriate level of management and were performed at the designated frequency. The inspectors verified that the appropriate safety management was included in the review and approval of procedure changes. The inspectors found no examples of outdated procedures during the inspection.

(2) Conclusions

Personnel changes did not appear to impact the responsibilities and functions specified in the license. The licensee's system to review and issue procedures adequately ensured that safety procedures were properly controlled and approved.

b. Internal Reviews and Audits (05.03), Safety Committees (05.04), Quality Assurance Programs (05.05)

(1) Inspection Scope and Observations

The inspectors reviewed quality assurance audits associated with the ISA, training programs, and implementation of the Safety & Safeguard Review Council (SSRC). Review and audits were conducted as required by the license and the licensee's internal program controls. Internal audits addressed a wide range of concerns and recommendations. The corrective action program tracked the management approved recommendations. The inspectors reviewed a sample of the resolutions and found them to adequately address the concerns detailed in the audit. No findings of significance were identified with the licensee's audit program.

The inspectors attended selected meetings and reviewed the most recent minutes from various SSRC meetings. The inspectors found that the meetings minutes from the calendar year 2006 included a review of new or revised facilities and equipment, NRC inspection findings, safety-related audit and inspection findings, and licensing deficiency reports. The inspectors found that the required disciplines (e.g. Safety, Security, Material Control and Accounting Management, Production, etc.) were represented in the meetings conducted. The inspectors found that the items reviewed were given appropriate consideration and management attention. No findings of significance were identified.

The inspectors also reviewed the effectiveness of the corrective action program. The inspectors noted that the problem identification, resolution and corrective action system (PIRCS) allowed the licensee to track issues and trend potential safety problems. The inspectors attended a PIRCS screening committee and an oversight committee meeting. The inspectors noted that overdue items, investigations, negative trends, and ways to improve the system were discussed. The inspectors reviewed the effectiveness of problem identification by plant personnel to ensure that all of the required items of concern were being documented in PIRCS. However, there were several instances where issues were not being properly identified in the PIRCS program. This deficiency was brought to the attention of senior management. The inspectors will continue to monitor this issue to ensure that no further examples of documenting issues are identified.

(2) Conclusions

Reviewed audits were of sufficient depth and appropriately targeted. The results were documented and conveyed to management, and audit findings were resolved in a timely manner. The inspectors determined that the licensee adequately implemented the SSRC. The inspectors will continue to monitor the effectiveness of the PIRCS program.

5. Radiation Protection of The Navy Fuel Process

a. Inspection Scope and Observations

The observed equipment used for detecting the presence of radiation and contamination was properly maintained and performed the intended safety function in a reliable manner. The external exposure monitoring program was implemented in a manner to maintain doses ALARA. The exposures were less than the occupational limits in 10 CFR 20.1201. Internal exposures were significantly less than the limits of 10 CFR Part 20.1201.

Respiratory protection equipment issuance and training ensured that equipment was obtained by certified users only. The licensee maintained appropriate records to demonstrate adequate implementation of the respiratory protection program.

Radiological safety postings and RWPs were properly used to communicate potential hazards and protective equipment requirements to workers.

The radiation and contamination survey programs were appropriately implemented to protect workers, and to identify potential work areas posing an internal or external radiation hazard to workers. A review of the licensee's PIRCS indicated that radiation and contamination problems and events were entered into PIRCS plant wide.

b. Conclusions

The radiation protection program was being implemented in accordance with regulations and license commitments. Self-assessments by the licensee and implementation of the as low as reasonably achievable (ALARA) program were adequate. The licensee's implementation of corrective actions to resolve violations of noncompliance in the area of Radiation Work Permits (RWPs) was adequate.

6. Operator Training/Retraining (IP 88010)

Adequacy of Training/Retraining

a. Inspection Scope and Observations

The inspectors reviewed the lesson plans and training materials for the licensee's radiological worker training and general employee training (GET). GET discussed the following topics: criticality safety, radiological safety, emergency response, industrial safety, chemical safety, and fire protection. The inspectors noted that the training emphasized the different ways that the employees have to notify management of any event or violation of regulatory requirements. The radiological worker training adequately described the radiological safety controls throughout the facility. The inspectors also observed a session of the radiological worker training practical test. As part of the test, a radiological control area was simulated and the employees had to follow all the required procedures to enter and exit the area. No findings of significance were identified.

The inspectors reviewed the lesson plans for Building 333 common training. Some of the topics covered by the training were general criticality safety requirements and postings, review of radioactive materials processed, emergency alarm and evacuation, abnormal operations and items relied on for safety. In addition, previous safety significant events were discussed during the training. The inspectors also observed a practical session of routine activities for Building 333. No findings of significance were identified.

The inspectors discussed with supervisors the process used to ensure that only trained personnel perform work. The supervisors stated that the training information was entered into a software database that allowed supervisors to verify an employee's qualification prior to being granted access to the work process areas. The inspectors reviewed with the supervisor the qualifications for several operators, noting no issues.

The inspectors observed on the job training (OJT) for the 100/200 process areas and the solvent extraction process to review the adequacy of the licensee's OJT and the operating procedures training. During interviews, the employees pointed out the safety precautions and upset conditions related to the process areas. The inspectors verified that the employees were aware of the radiological and criticality safety concerns, and safety controls of the designated work area. The inspectors were also able to see the trainer interact with trainees and verify the adequacy of the training. No findings of significance were identified.

b. Conclusions

The licensee provided adequate training to its employees in the required areas of radiation protection, criticality safety, emergency preparedness, procedure adherence, and general employee training. The training observed indicated that the employees had a good understanding of the training acquired and how it is implemented in the work area.

7. **Strike Contingency Plan (IP 92709, 92711)**

Adequacy of Strike Contingency Plan

a. Inspection Scope and Observations

The inspectors reviewed the licensee's ongoing actions in response to the continuing strike. Observation of vehicle access and personnel egress from the site did not identify any problems between NFS staff and the picket line. The inspectors interviewed managers and supervisors in critical areas of the facility to ensure that they were currently completing those tasks assigned to them as identified in the Strike Contingency Plan. The licensee had implemented their process for replacement workers and shifts necessary to carry out operations in the current shutdown mode and upcoming resumption of operations. In addition, the managers have completed operator training for the Navy Fuel Operations.

The inspectors observed numerous activities and determined that personnel assignments have been properly and adequately performed.

The inspectors found the licensee's continuing security preparations during the strike preparations to be effective in providing site control and security.

b. Conclusions

The inspectors determined that the licensee had developed an adequate strike contingency plan and had made the necessary security preparations for the strike.

8. **Follow-up on Previously Identified Issues**

(Closed) IFI 70-143/2004-011-01: The inspectors reviewed the issue in which a portable HEPA filter was discovered to not have a criticality evaluation associated with its use and presence in the material controlled area. The inspectors reviewed the original and revised safety evaluation and found no issues. The inspectors also noted the HEPA filter was in use at the BLEU complex. This item is considered closed.

(Closed) VIO 70-143/2005-008-02: The inspectors reviewed corrective actions taken by the licensee to address the failure to implement the lockout tagout procedure. The inspectors reviewed the revised procedure NFS-GH-36, training documents, a quality assurance audit of the program, and walked down several permits being implemented in the process. No issues were noted. This item is considered closed.

(Closed) VIO 70-143/2005-010-05: The inspectors reviewed corrective actions taken by the licensee to address the failure to verify the SNM concentration in a waste tank. The inspectors reviewed the toolbox training documents, and verified that pertinent block and bleed valves were closed. The inspectors also reviewed the implementation of the use-everytime-procedures in the naval fuel operations and the BLEU preparation facility. No issues were noted. This item is considered closed.

[REDACTED]

(Closed) IFI 70-143/2005-010-07: The inspectors reviewed the issue in which criticality detectors were resetting back to default values without any indication. The licensee isolated the root-cause of the issue to be the RADnet software, which was used for monitoring the detection system. The licensee then suspended use of the software and is in the process of developing an in-house substitute. No issues were noted with the licensee's investigation or actions. This item is considered closed.

(Closed) VIO 70-143/2006-003-01: The inspectors reviewed corrective actions taken by the licensee to address the failure to implement criticality safety procedures. The inspectors reviewed toolbox training documents, and verified implementation of CL-26 in various process areas. No issues were noted. This item is considered closed.

(Closed) VIO 70-143/2006-003-02: The inspectors reviewed corrective actions taken by the licensee to address the violation that involved the uranium aluminum gloveboxes overflow system that was insufficiently sized to account for potential for vacuum in the gloveboxes. The inspectors reviewed the new setpoint calculations, as well as the new setpoint procedure, for the overflows of the gloveboxes. The inspectors also noted that the gloveboxes for other areas were included in the licensee's corrective actions. No issues were noted. This item is considered closed.

(Reviewed) IFI 70-143/2006-007-01: The inspectors reviewed the licensee's actions in response to the post maintenance deficiency that could occur when safety controls affected more than one system. The inspectors discussed the licensee's actions to address the issue with the ISA manager. The ISA manager detailed the plans and schedule that had been created to address the issue. The licensee had a target completion date of June 2007, to properly incorporate all the interrelating SRE tests/controls into the database. The database would be used to identify the necessary SRE tests for all the potentially affected controls following a maintenance activity. No issues were noted with the plan, however, this item will be left open to review the licensee's progress at a date closer to completion.

(Closed) IFI 70-143/2006-010-02: The inspectors reviewed investigation report 70X-06-017 and PIRCS item 8241 regarding a spill in building 302. The inspectors evaluated the corrective actions and performed a system walkdown following the spill to validate the conclusions of the investigation report. No significant issues were noted. This item is considered closed.

8. **Exit Meeting**

The inspection scope and results were presented to licensee management at various meetings throughout the inspection period and were summarized on October 16, 2006. No dissenting comments were received from the licensee.

[REDACTED]

ATTACHMENT

1. PERSONS CONTACTED

Partial List of Persons Contacted

R. Droke, Licensing & Compliance Director/Acting Safety Director
 K. Guinn, Advisor
 G. Hazlewood, Engineering Director
 N. Kenner, Training Manager
 T. Lindstrom, Executive Vice President, HEU Operations
 J. McCabe, Corrective Actions Program Manager
 M. Moore, Vice President, Safety & Regulatory
 J. Nagy, Senior Licensing & Regulatory Compliance Officer
 R. Shackelford, Nuclear Criticality Safety Manager
 A. Vaughan, Fuel Production Director
 J. Wheeler, Licensing & ISA Manager
 D. Wise, Vice President, Fuel Production

2. INSPECTION PROCEDURES USED

TI 2600/012	Institutionalizing Concern Regarding Safety Issues Identified in Selected Past Generic Communications
IP 88005	Management Organization and Controls
IP 88010	Operator Training/Retraining
IP 88020	Plant Operations
IP 88135	Resident Inspector Program for Category 1 Fuel Cycle Facilities
IP 92709	Strike Contingency Plan
IP 92711	Continued Implementation of Strike Plans During an Extended Strike

3. LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

70-143/2004-011-01	Closed	IFI	Evaluation of Portable HEPA filters
70-143/2005-007-01	Closed	VIO	Failure to review and follow RWP procedures; three examples.
70-143/2005-008-02	Closed	VIO	Failure to implement the LOTO procedure
70-143/2006-010-02	Closed	IFI	Spill in Building 302
70-143/2005-010-05	Closed	VIO	Failure to verify SNM concentration in waste
70-143/2005-010-06	Closed	VIO	Failure to comply with RWP procedures
70-143/2005-010-07	Closed	IFI	RMS-3 Criticality Alarm unit failure

70-143/2006-001-03	Closed	VIO	Failure to follow radiological protection clothing requirements
70-143/2006-003-01	Closed	VIO	Failure to implement criticality safety procedures
70-143/2006-003-02	Closed	VIO	Violation A was a failure to develop and implement a design for the uranium aluminum enclosure overflow system that 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 was opened as a tracking mechanism for closure of a previously identified and closed Apparent Violation (EA-06-018).
70-143/2006-007-01	Reviewed	IFI	Post maintenance deficiency when safety controls effects more than one system
70-143/2006-010-02	Closed	IFI	Spill in Building 302