



D. Ferguson

2

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: NRC Inspection Report

cc w/encl:  
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/encl:  
D. Ayres, RII  
W. Gloersen, RII  
S. Burris, RII  
M. Galloway, NMSS  
K. Ramsey, NMSS  
M. Lamastra, NMSS

U. S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.: 70-143

License No.: SNM-124

Report No.: 70-143/2006-07

Licensee: Nuclear Fuel Services, Inc.

Facility: Erwin Facility

Location: Erwin, TN 37650

Dates: April 3, 2006 - April 7, 2006

Inspectors: M. Crespo, Fuel Facility Inspector  
D. Hartland, Senior Fuel Facility Inspector  
O. Lopez, Fuel Facility Inspector  
T. Powell, Nuclear Criticality Safety Reviewer  
N. Rivera, Fuel Facility 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 70-143/2006-07

This inspection involved the review of Naval Fuel Operations (NFO) programs and systems by regional inspectors and a headquarters criticality safety reviewer.

### NFO Configuration Review

- The NFO's configuration was adequately captured in the piping and instrumentation diagrams with no safety deficiencies.
- The electrical schematics of active engineered controls were not typically placed under configuration control and relied solely on post-maintenance testing to verify the proper configuration.

### Work Request System Review

- The licensee's work request systems relied heavily on the initiating engineer and engineering director to properly categorize work requests, which affect the level of safety reviews necessary.
- An inspector follow-up item was opened to track the licensee's actions to ensure all safety systems related to a safety control have the appropriate post-maintenance testing performed.

### Operational Safety Review

- The licensee adequately implemented the management measures on the items relied on for safety that were reviewed.
- The licensee's operators were knowledgeable on how to identify and respond to events.

### Design Guidance Review

- The licensee's design guidance for engineers provided no extra detail outside of recognized standards for items that are important to safety.
- 

Licensee Audit and Corrective Action Program Review

- Licensee's vertical slice review lacked depth and did not focus on safety significant systems.
- The licensee's corrective action system demonstrated adequate trending and input of items, but the trends also indicated inadequate response to certain recurring issues.

Attachment:

Partial List of Persons Contacted

Inspection Procedures Used

List of Items Opened, Closed, and Discussed

List of Acronyms



[REDACTED]

## REPORT DETAILS

### 1. Summary of Plant Status

The Naval Fuel Operations (NFO) were conducted normally with no unusual events during this period.

### 2. NFO Configuration Review

#### (1) Scope and Observations

The inspectors performed a vertical slice review of several risk significant areas of operation, including the [REDACTED] and [REDACTED], transfer line operations in [REDACTED] and [REDACTED] of [REDACTED], and the recovery area in [REDACTED]. The review began with a comparison of the current configurations with the respective piping and instrumentation diagrams (P&IDs). The inspectors noted no significant discrepancies between the current configuration of the process areas and the drawings. The inspectors also noted that the configuration of various items relied on for safety (IROFS) included adequate backflow prevention from favorable to non-favorable geometry vessels. The inspectors also noted that out of service equipment was properly isolated from active systems.

The inspectors then reviewed the standard operating procedures for the respective areas to verify that they accurately reflected the configuration in the field. This review also analyzed the number of Letters of Authorization (LOA) in use in the NFO, which are used to issue non-permanent procedures or modifications to existing procedures. No issues were noted with the operating procedures or the number of LOAs issued in NFO. The inspectors also reviewed several generic procedures, such as [REDACTED] and [REDACTED], that applied to NFO. The inspectors found the generic procedures to be vague and lacked detail. However, the inspectors noted that the standard operating procedures for the specific equipment of NFO had detailed instructions on how to perform the evolutions.

The inspectors then reviewed the approvals and safety reviews for the new construction in [REDACTED] and the [REDACTED]. The inspectors determined that the approvals were properly obtained. The inspectors also reviewed the fire hazard analysis and risk evaluations for the new areas. No issues were noted with the current state of the evaluations. The inspectors also reviewed the modification to the operation readiness review procedure (NFS-GH-902) that now explicitly detailed when new construction can be tied into active equipment. The procedure required specific approvals from safety prior to making any utility or process connections to active lines. The inspectors then verified that utilities for the [REDACTED] construction were properly isolated since the safety reviews had yet to be performed. The inspectors also walked down with licensee

[REDACTED]

staff the ventilation system and electrical connections for the process logic controllers, interlocks, thermocouple connections, and wiring in the [REDACTED]. No issues were noted.

The inspectors determined that the licensee did not place electrical schematics of active engineered controls (AECs) under configuration control. Therefore, the licensee did not perform independent verifications or auditing of these configurations. The licensee essentially depended on the adequacy of post-maintenance testing to determine if AECs have been properly wired to respond to safety conditions. The inspectors found this to be a potentially significant weakness in the licensee's configuration control program due to the potential to have active engineered safety controls adversely affected. This issue was identified in a previous NRC inspection report (70-143/2006-002) and is being tracked as an unresolved item.

(2) Conclusions

The NFO's configuration was adequately captured in the P&IDs with no safety deficiencies. The electrical schematics of AECs were not typically placed under configuration control and relied solely on post-maintenance testing to verify the proper configuration.

3. Work Request Review

(1) Scope and Observations

The next portion of the vertical slice inspection involved a review of the implementation of the work request system for the respective areas. Work requests of varying significance were reviewed to determine if they were properly categorized and obtained the appropriate level of safety review. No issues were noted with the implemented work requests or the corresponding safety reviews. However, one approved work request was noted to have a deficiency. The inspectors noted a planned work request that involved the modification of the carbon dioxide fire suppression system wiring to prevent shutdowns of [REDACTED]. The work request stated that the interlock wiring for the carbon dioxide system would need to be modified. However, the work request was categorized as a Minor 2, which does not require a significant safety review, even though significant safety systems were being affected. This work request was never implemented, but it demonstrated the licensee's over-reliance on engineers to determine if maintenance work required a safety review. When this issue was brought to the attention of the licensee, safety management indicated that this type of work should not be allowed on a Minor 2 work request. The licensee stated that additional detail would be included in the work request procedure (Standard Operating Procedure 392) to more clearly define the criteria for a Minor 2 work request.

[REDACTED]

The inspectors also noted that the planned post-maintenance testing would not test the carbon dioxide system's interlocks, only those for [REDACTED]. Thus, this work request affected the safety controls for two systems, however, the licensee did not recognize the need to functionally test one of them. When this was brought to the licensee's attention, the licensee agreed that there was a deficiency in the identification of all the applicable systems affected by this safety control. An Inspector Follow-up Item (IFI) 2006-007-01 was opened to track the licensee's actions to correct this issue.

(2) Conclusions

The licensee's work request systems relied heavily on the initiating engineer and engineering director to properly categorize work requests, which affect the level of safety reviews necessary. An IFI was opened to track the licensee's actions to ensure all safety systems related to a safety control have the appropriate post-maintenance testing performed.

4. Operational Safety Review

(1) Scope and Observations

The inspectors continued with vertical slice inspection of the NFO through a verification of IROFS and management measures for [REDACTED] and the recovery area of [REDACTED]. The inspectors walked down a selection of IROFS to verify that they were present and implemented adequately. No issues were identified with the reviewed IROFS. The inspectors also reviewed functional tests and inspection records for the IROFS. The functional tests were performed at the required frequency and contained the appropriate amount of detail to adequately test of the safety function.

The inspectors reviewed the nuclear criticality safety evaluation for the [REDACTED] tanks to determine that criticality safety was assured through engineering and administrative controls with adequate safety margin/certainty, preparation and review by qualified staff. No issues with the analysis were noted.

The inspectors conducted interviews with operators to ensure that they knew how to identify and respond to unusual events or abnormal conditions. No problems were identified. The inspectors also questioned the operators and pertinent engineers regarding their knowledge of IROFS of their systems. No significant deficiencies were noted.

(2) Conclusions

The licensee adequately implemented the management measures on the IROFS that were reviewed. The licensee's operators were knowledgeable on how to identify and respond to events.

[REDACTED]

## 5. Design Guidance Review

### (1) Scope and Observations

The inspectors reviewed the licensee's available design guidance for engineers. The inspectors found the guidance to be vague or non-existent in many areas. The bulk of the guidance simply gave reference to pertinent standards that should be consulted for material of construction and piping dimensions. No guidance was found on how to properly design a system to prevent backflow into a process vessel. Also, no guidance was found on how to properly account for process upset conditions. The licensee had no specific requirements for design guidance to the engineering function, however, the inspectors communicated this observed weakness to the licensee. The inspectors did not identify any design deficiencies in NFO.

### (2) Conclusions

The licensee's design guidance for engineers provided no extra detail outside of recognized standards for items that are important to safety.

## 6. Licensee Audit and Corrective Action Program Review

### (1) Scope and Observations

The inspectors reviewed several of the licensee's walk downs of select P&IDs. The inspectors noted that several of the P&IDs that the licensee had selected did not include any safety controls. However, the licensee chose these to re-establish confidence in their configuration management system since these drawings were some of the oldest and therefore had a higher probability of having errors. No major issues were found by the licensee, but the results from the audit were not formally captured in a commitment tracking system. The minor issues found were simply passed along to the area owners and assumed to be addressed if the resources were available. Also, the inspectors noted that while the audits were independent, they were not implemented with a formal procedure. The inspectors attempted to verify the licensee's "re-assessment of the safety controls" as stated in their response to the Confirmatory Action Letter No. 02-06-003, March 18, 2006. The inspectors discovered that a communication error had occurred and the statement actually referred to the Blended Low Enriched Uranium Preparation Facility instead of NFO.

The inspectors reviewed the quality assurance audit of the configuration management program and the biennial nuclear criticality safety audit for [REDACTED]. No issues were noted.

The inspectors reviewed the Problem Identification, Resolution and Corrective Action System (PIRCS), the licensee's corrective actions program, to verify that items were being adequately input into the system, tracked, and corrected. The inspectors noted

[REDACTED]

[REDACTED]

that the licensee properly used to the system to input, track and trend reoccurring issues. However, the inspectors noted a lack of adequate response to certain events. Specifically, the inspectors noted an adverse trend regarding the blockage of the [REDACTED], resulting in the routine actuation of an IROFS (automatic shutdown due to high pressure). The licensee had identified the adverse trend; however effective actions had not yet been taken to address it. Although not an immediate safety issue, the inspectors concluded that the licensee's acceptance of a routine challenging of an IROFS to be a poor operational practice. When this issue was communicated to the licensee, the licensee indicated that the issue had recently been elevated to a root cause investigation to try and correct it.

The inspectors reviewed the licensee's actions leading up to a reportable event in [REDACTED] on [REDACTED]. The event was reviewed to verify if opportunities for identification were missed. The inspectors reviewed the data sheets and interviewed the operators in the area. Based on the interviews and the documentation reviewed, the licensee did not miss an early indication of a potential event.

(2) Conclusions

Licensee's vertical slice review lacked depth and did not focus on safety significant systems. The licensee's corrective action system demonstrated adequate trending and input of items, but the trends also indicated inadequate response to certain recurring issues.

7. Exit Meeting

The inspection scope and results were presented to members of the licensee management on April 7, 2006. Proprietary documents and processes were reviewed during this inspection. No dissenting comments were received from the licensee.

[REDACTED]

**ATTACHMENT**

**1. PERSONS CONTACTED**

Partial List of Licensee's Persons Contacted

R. Droke, NFS Licensing & Compliance Director  
G. Hazelwood, Engineering Director  
D. Ferguson, Chief Executive Officer  
M. Moore, Vice President, Safety and Regulatory  
J. Parker, Industrial Safety Manager  
J. Quillen, Process Engineer  
R. Shackelford, Nuclear Criticality Safety Manager  
M. Shope, Quality Engineering Supervisor  
M. Tester, Sr. Manager, Radiation Control  
G. Tipton, Director, Plant Facilities  
A. Vaughn, Director, Fuel Production  
A. Ward, General Counsel  
J. Wheeler, Integrated Safety Analysis Manager  
D. Wise, Vice-president of Fuel

**2. INSPECTION PROCEDURES (IPs) USED**

IP 88020      Regional Nuclear Criticality Safety Inspection Program  
IP 88005      Management Organization and Controls  
IP 88010      Operator Training/Retraining

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

<u>Item Number</u>	<u>Status</u>	<u>Type</u>	<u>Description</u>
70-143/2006-07-01	Open	IFI	Licensee's actions to address post-maintenance deficiency when safety control effects more than one system.



4. **LIST OF ACRONYMS USED**

ADAMS	Agencywide Documents Access and Management Systems
AEC	Active Engineered Control
CFR	Code of Federal Regulations
IFI	Inspection Followup Item
IP	Inspection Procedures
IROFS	Item Relied On For Safety
LOA	Letter of Authorization
NFO	Naval Fuel Operations
NFS	Nuclear Fuels Services
NRC	Nuclear Regulatory Commission
P&IDs	Piping and Instrumentation Diagram
PARS	Publicly Available Records
PIRCS	Problem Identification, Resolution and Corrective Action System
SNM	Special Nuclear Material
WD	Waste Discard

