

July 12, 2013

Mr. Joseph G. Henry, President  
Nuclear Fuel Services, Inc.  
P. O. Box 337, MS 123  
Erwin, TN 37650

SUBJECT: NUCLEAR FUEL SERVICES, INC. – U.S. NUCLEAR REGULATORY  
COMMISSION INSPECTION REPORT NO. 70-143/2013-203

Dear Mr. Henry:

The U.S. Nuclear Regulatory Commission (NRC) conducted a routine, announced Nuclear Criticality Safety (NCS) inspection at your facility in Erwin, Tennessee, June 10th-13th, 2013. The purpose of the inspection was to determine whether activities involving special nuclear material were conducted safely and in accordance with your license and regulatory requirements. Throughout the inspection, observations were discussed with your staff. An exit meeting was held on June 13th during which inspection observations and findings were discussed with your management and staff.

The inspection, which is described in the enclosure, focused on the most hazardous activities and plant conditions; the most important controls relied on for safety and their analytical basis; and the principal management measures for ensuring controls are available and reliable to perform their functions relied on for safety. The inspection consisted of analytical basis review, selective review of related procedures and records, examinations of relevant NCS-related equipment, interviews with NCS engineers and plant personnel, and facility walkdowns to observe plant conditions and activities related to safety basis assumptions and related NCS controls. Based on the inspection, your activities involving nuclear criticality hazards were found to be conducted safely and in accordance with regulatory requirements.

In accordance with Title 10 of the *Code of Federal Regulations* 2.390 of NRC's "Rules of Practice," a copy of this letter and the enclosure will be made publicly available in the public electronic reading room of the NRC's Agencywide Document Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>.

J. Henry

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If you have any questions concerning this report, please contact Timothy Sippel, of my staff, at (301) 287-9151, or via email to [Timothy.Sippel@nrc.gov](mailto:Timothy.Sippel@nrc.gov).

Sincerely,

*/RA/*

Michael X. Franovich, Chief  
Programmatic Oversight and  
Regional Support Branch  
Division of Fuel Cycle Safety  
and Safeguards  
Office of Nuclear Material Safety  
and Safeguards

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

Enclosure:  
NRC Inspection Report 70-143/2013-203  
w/Attachment: Supplementary Information

cc w/enclosure: See page 3

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cc w/enclosure:

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**U.S. NUCLEAR REGULATORY COMMISSION  
OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS**

Docket No.: 70-143

License No.: SNM-124

Report No.: 70-143/2013-203

Licensee: Nuclear Fuel Services, Inc.

Location: Erwin, TN

Inspection Dates: June 10-13, 2013

Inspectors: Timothy Sippel, Criticality Safety Inspector, NRC HQ  
Greg Chapman, Criticality Safety Inspector, NRC HQ  
Patricia Glenn, Fuel Facility Inspector, NRC RII

Approved by: Michael X. Franovich, Chief  
Programmatic Oversight and  
Regional Support Branch  
Division of Fuel Cycle Safety  
and Safeguards  
Office of Nuclear Material Safety  
and Safeguards

Enclosure

## EXECUTIVE SUMMARY

### Nuclear Fuel Services, Inc. NRC Inspection Report 70-143/2013-203

#### Introduction

Staff of the U.S. Nuclear Regulatory Commission (NRC) performed a routine, announced Nuclear Criticality Safety (NCS) inspection of the Nuclear Fuel Services, Inc., (NFS) facility, License Number SNM-124, in Erwin, Tennessee, from June 10-13. The inspection included an onsite review of the licensee's NCS program, NCS evaluations, NCS audits and inspections, internal NCS event review and follow-up, plant operations, and open items follow-up. The inspection focused on risk-significant fissile material processing activities and areas including the blended low-enriched uranium (BLEU) complex, commercial development (CD) line, blended low-enriched uranium processing facility (BPF), and high-enriched uranium (HEU) fuel fabrication.

#### Results

- An Unresolved Item (URI) was opened regarding conformance with the requirement in Title 10 of the *Code of Federal Regulations* (10 CFR) 70.72(f) for a written evaluation that provides the bases for the determination that the changes do not require prior NRC approval.
- No other safety concerns were identified regarding implementation of the NCS program.
- No safety concerns were identified regarding the licensee's NCS audits and weekly inspections.
- No safety concerns were identified during review of recent licensee internal NCS event review and follow-up, or tracking and resolution of corrective actions.
- No safety concerns were identified during walkdowns of plant operations.

## REPORT DETAILS

### 1.0 Summary of Plant Status

NFS, License Number SNM-124, produces uranium oxides from low-enriched uranium (LEU) liquid, conducts routine ammonia recovery process and liquid waste treatment at its Erwin, Tennessee site. During the inspection, NFS was performing routine fuel fabrication, parts of the BPF were shutdown, and the BLEU complex was shutdown and preparing for decommissioning.

### 2.0 Nuclear Criticality Safety Program (IP 88015 & 88016)

#### a. Inspection Scope

The inspectors reviewed the licensee's NCS program and analyses to assure the safety of fissile material operations. The inspectors reviewed selected Nuclear Criticality Safety Evaluations (NCSEs) to determine that criticality safety of risk-significant operations was assured through engineered and administrative controls with adequate safety margin and prepared and review by qualified staff. The inspectors accompanied NCS and other technical staff on walkdowns of NCS controls in selected plant areas. The inspectors interviewed licensee managers and engineers in the safety and production departments, operations engineers, and selected operators. The inspectors reviewed selected aspects of the following documents:

- 54T-13-0004, "310 Warehouse," Rev. 2, dated March 20, 2013.
- 54T-13-0008, "Building 100 NDA Laboratory," Rev. 2, dated April 2013.
- 54X-06-0024, "Nuclear Criticality Safety Evaluation for Area 600 of the Production Fuel Facility," Rev. 3, dated January 5, 2007.
- 54X-13-0004, "Nuclear Criticality Safety Evaluation for Area 800 of the Production Fuel Facility," Rev. 10, dated April 19, 2013.
- 54X-13-0005, "Control Flowdown and Field Verification For Area 800," Rev. 9, dated May 20, 2013.
- C-HS-003, "NFS Nuclear Criticality Safety (NCS) Policy," Rev. 2, April 17, 2009.
- CA [(Corrective Action)] #2549, dated September 16, 2005.
- CA #10353, dated October 5, 2009.
- MNE-13-001, "Inactivation of Building 301," dated April 1, 2013.
- NFS-GH-913, "Nuclear Criticality Safety Program," Rev. 3, dated January 16, 2013.
- NFS-HS-A-67-A, "Safety & Regulatory Review Routing Form," Rev. 1, dated April 8, 2011.
- CCP-20121015, "Removal of vault door hand key system," date approved June 5, 2013.
- CCP-20130001, "Building 301 Inactivation," date approved April 17, 2013.
- CCP-20131492, "Replace 307-FCV-852m with an equivalent," date approved June 4, 2013.
- CCP-20131511, "Install TPVC Shroud," date approved May 23, 2013.
- CCP-20131527, "Install Fixed NO<sub>x</sub> Detection at Bldg. 333 Column Dissolvers," date approved June 5, 2013.
- PIRCS #6068, dated September 14, 2005.
- PIRCS #21297, dated October 5, 2009.

b. Observations and Findings

The inspectors observed that the licensee had an NCS program which was independent from production and was implemented through written procedures. The inspectors determined that, for the NCSEs reviewed, the NCSEs were: performed by qualified NCS engineers, that independent reviews of the evaluations were completed by qualified NCS engineers, and that the analyses provided for subcriticality of the systems and operations through appropriate limits on controlled parameters. The inspectors reviewed selected items relied on for safety (IROFS) supporting NCS controls and determined that the IROFS corresponded to the approved analytical results and designated controls and were adequate to meet performance requirements for the selected accident sequences. NCSEs and supporting calculations demonstrated adequate identification and control of NCS hazards to assure operations within subcritical limits.

During the recent revision to one of the NCSEs, 54T-13-0004, the licensee incorporated CA #2549, and CA #10353, which were opened in response to PIRCS #6068, and PIRCS #21297, respectively. Their due date had been pushed out to 2020 when they were made 'long-term' items (see IFI 70-143/2013-201-01 in Section 6.0). But in January 2012 the NCS manager moved their due date up. They were closed after the revised NCSE was issued. PIRCS #21297 dealt with clarifying where controls applied. PIRCS #6068 dealt with clarifying that diked areas don't constitute enclosures. This is a case where the licensee was addressing 'long-term' items that were opened to track suggested improvements to the NCSEs.

The inspectors also observed that the licensee's NCS program reviewed process changes that could affect criticality safety. Changes were reviewed by qualified NCS engineers and documented on routing form NFS-HS-A-67-A in accordance with written procedures (such as NFS-GH-913). The form also documents the evaluation performed under 10 CFR 70.72. The inspectors reviewed a sample of recent licensee routing forms and discussed them with engineering staff and management. The review focused on those changes reviewed by the licensee's NCS function. The licensee requires in the routing form that the NCS function review all changes involving SNM equipment or processes. So the NCS function generally reviews all changes, unless they have been specifically exempted. The NCS manager stated that they review ~1500 of these changes a year. In the cases the inspector reviewed the licensee appeared to correctly determine the need for prior NRC approval; and in most cases the change obviously didn't require prior NRC approval. No safety concerns were identified with the licensee's review of changes, including performing the 70.72 evaluation to determine if the change requires prior NRC approval.

However, the licensee's procedures don't require the reviewers to document the bases for the determination that the changes do not require prior Commission approval. The form does contain the statement "Be prepared to justify you answer" in several places; but the inspectors were told that this doesn't constitute a requirement to document such justification, just to have a justification. NCS engineers reviewing changes often provide comments; however, these comments generally don't provide "the bases for the determination..." Providing comments is optional, and the procedures don't specify the level of detail for the comments, although NCS engineers sometimes provided more documentation for more complex or risk significant changes.



This does not appear to conform to 10 CFR 70.72(f) which requires “a written evaluation that provides the bases for the determination that the changes do not require prior Commission approval...” The licensee’s checklist with comments does not appear to ensure that this is always provided. The inspectors noted 70.72(f) doesn’t distinguish between changes based on the complexity of the change. A written evaluation is required by 70.72(f), but for simple plant changes a checklist may be sufficient documentation of the basis of the evaluation. Therefore, the NRC is opening **Unresolved Item (URI) 70-143/2013-203-01** to track this issue.

c. Conclusions

A URI was opened regarding conformance with the requirement in 10 CFR 70.72(f) for a written evaluation that provides the bases for the determination that the changes do not require prior NRC approval. No other safety concerns were identified regarding the NCS program.

### 3.0 Nuclear Criticality Safety Inspections, Audits, and Investigations (IP 88015)

a. Inspection Scope

The inspectors reviewed licensee internal audit and inspection procedures, and results of the most recent NCS audits and inspections to assure that appropriate issues were identified and resolved. The inspectors reviewed selected aspects of the following documents:

- NCS-2013-05, “Nuclear Criticality Safety Audit of the Nuclear Criticality Safety Evaluation for the BLEU Complex Uranyl Nitrate Building,” 5<sup>th</sup> Audit, dated April 5, 2013.
- NCS-2013-06, “Sixth Nuclear Criticality Safety Audit of the Nuclear Criticality Safety Evaluation for Area E of the Uranium Recovery Facility,” 6<sup>th</sup> Audit, dated April 17, 2013.
- NCS-2013-07, “Nuclear Criticality Safety Audit of the Nuclear Criticality Safety Evaluation for Uranium Recovery Solvent Extraction Areas G, H, and J,” 6<sup>th</sup> Audit, April 22, 2013.
- NCS-2013-08, “Sixth Nuclear Criticality Safety Audit of the Nuclear Criticality Safety Evaluation for Area F of the Uranium Recovery System,” 6<sup>th</sup> Audit, dated April 23, 2013.
- NCS-2013-09, “Nuclear Criticality Safety Audit of the Nuclear Criticality Safety Evaluation for Area 600,” 7<sup>th</sup> Audit, dated May 6, 2013.
- NCS-2013-10, “Seventh Nuclear Criticality Safety Audit of the Nuclear Criticality Safety Evaluation for Rocket Storage in the Laboratory,” 7<sup>th</sup> Audit, dated May 13, 2013.
- NCS-2013-11, “Nuclear Criticality Safety Audit of the Nuclear Criticality Safety Evaluation for the CDL Process Ventilation,” 2<sup>nd</sup> Audit, dated May 15, 2013.
- NFS-HS-A-16, “Safety Audits, Assessments, and Inspections,” Rev. 14, dated January 16, 2013.
- NFS-HS-B-91-01, “Attachment B, Emergency Escape Breathing Apparatus,” Rev. 0, (forms documenting the monthly audits of the emergency escape respirators), dated Jan/2013, Feb/2013, and March/2013.

b. Observations and Findings

The inspectors observed that the licensee's NCS audits and inspections were conducted in accordance with written procedures. Based on document review, the inspectors noted that the audits were performed by NCS engineers who reviewed open NCS issues from previous audits; reviewed the adequacy of control implementation; reviewed plant operations for compliance with license requirements, procedures, and postings; and examined equipment and operations to determine that past evaluations remained adequate. The inspectors confirmed that deficiencies identified during licensee's inspections were appropriately captured in the licensee's corrective action program and resolved in a timely manner. (See the discussion of IFI 70-143/2013-201-01 below, for some items that were not resolved in a timely manner.)

Inspectors accompanied a licensee NCS engineer during the routine weekly inspection of the fuel manufacturing facility. During the inspection, the engineer reviewed mass logs, spoke with operators, and observed the area looking for housekeeping and maintenance issues. During the inspection, inadvertent unfavorable geometry containers were discovered in a container controlled area. These were escape air respirator containers which are located throughout the area where the CO<sub>2</sub> fire suppression system is installed. The adhesive that holds view ports to the otherwise fully enclosed container was degrading. The inspectors observed that in some cases the adhesive degradation allowed the view ports to come loose and/or unattached which provided a possible entry point for fissile solutions into the container. Several containers were found with this condition and an immediate corrective action was initiated to duct tape all view ports to their containers, which temporarily secured the view ports. The licensee generated PIRCS #39878 to assess and correct the respirator container situation permanently. Inspectors noted that duct tape had previously been utilized to secure some of the view ports. Further inquiry determined that Rad Con Technicians who perform monthly audits of the respirators had noticed the loose view ports and duct taped them to ensure cleanliness of the enclosed respirators. They felt this returned the containers to essentially the same state as when they were installed. The loose view ports were not reported through PIRCS. This was a "miss" for reporting a condition that was adverse to safety through the PIRCS system and could have brought the inadvertent container issue to the attention of NCS supervision in a more timely manner. The licensee generated PIRCS #39907 to address the lack of problem identification.

c. Conclusions

No safety concerns were identified regarding the licensee NCS audits and inspections. Minor issues associated with the inadvertent containers are to be addressed in PIRCS #39878 and #39907.

**4.0 Nuclear Criticality Safety Event Review and Follow-up (IP 88015 & 88016)**

a. Inspection Scope

The inspectors reviewed the licensee response to a selection of recent internally-reported events. The inspectors reviewed the progress of investigations and interviewed licensee staff regarding immediate and long-term corrective actions. The inspectors reviewed selected aspects of the following documents:

- NFS-GH-65, "Problem Identification," Rev. 7, September 10, 2012.
- NFS-GH-922, "The NFS Problem Identification, Resolution, and Correction System (PIRCS)," Rev. 12, March 19, 2012.
- PIRCS # 39546, dated May 15, 2013
- PIRCS # 39654, dated May 23, 2013
- PIRCS # 39178, dated April 17, 2013
- PIRCS # 39776, dated June 4, 2013
- PIRCS # 39239, dated April 23, 2013
- PIRCS # 39171, dated April 17, 2013
- CA # 20320, dated May 30, 2013
- CA # 19992, dated April 19, 2013
- Investigation # 16120, dated April 19, 2013
- Investigation # 16121, dated April 19, 2013
- Investigation # 16230, dated May 20, 2013
- Investigation # 16310, dated June 6, 2013
- Investigation # 16146, dated April 26, 2013

b. Observations and Findings

The inspectors reviewed select licensee internally reported events generated since the last nuclear criticality safety inspection. This included reviewing the problem report, investigation conducted, and corrective action(s) taken that were associated with the select internally reported events. The inspectors also interviewed licensee staff concerning these events and the tracking and trending of internal events. Additionally, the inspectors performed field walk-downs to independently evaluate the internal events reported and verified that all corrective actions required were implemented as committed to. The inspectors determined that the licensee adequately evaluated whether or not these events were reportable to the NRC. The inspectors observed that internal events were investigated in accordance with written procedures and appropriate corrective actions were assigned and tracked.

c. Conclusions

No safety concerns were identified during review of recent licensee internal NCS event review and follow-up, or tracking and resolution of corrective actions.

## 5.0 **Plant Activities (IP 88015)**

a. Inspection Scope

The inspectors performed plant walkdowns to review activities in progress and to determine whether risk-significant fissile material operations were being conducted safely and in accordance with regulatory requirements. The inspectors interviewed operations staff and NCS engineers both before and during walkdowns. The inspectors reviewed selected aspects of the following documents prior to performing the walkdowns:

- Blended Low-Enriched Uranium (BLEU) Preparation Facility
- BLEU Complex

- Building 105
- Building 333
- Building 440
- Commercial Development (CD) Line
- Naval Fuel
- NDA Laboratory in Building 100
- Solvent Extraction

b. Observations and Findings

The inspectors verified that controls identified in NCS analyses were installed or implemented and were adequate to ensure safety. The inspector also verified that safety was maintained for observed facility operations. The cognizant NCS engineers were knowledgeable and interacted regularly with operators on the process floors. The inspectors verified the adequacy of management measures for assuring the continued availability, reliability, and capability of safety-significant controls relied upon by the licensee for controlling criticality risks.

The inspectors walked down the NDA Laboratory in Building 100. During the walkdown the inspectors discussed the NCS controls and process operations with an NDA technician and the licensee NCS engineer responsible for laboratories. The inspectors reviewed the forms that document the lab's compliance with the licensee's procedures for mass control; as well as verifying that the assumptions in the NCSE bound the actual process conditions.

Inspectors toured the BLEU complex which has been shut down. When the facility was operating it converted Uranyl Nitrate to  $UO_2$  powder for use in commercial power reactor fuel. The Uranyl Nitrate was received from downblending at the BPF and other sources. After the process was shut down the licensee conducted a partial clean out of the BLEU complex. Solution was drained and vacuumed out; powder was blown and knocked out of powder handling equipment, however, no equipment was disassembled. Based on previous experience the licensee expects to be able to retrieve more material from equipment that can be easily disassembled.

The cognizant licensee NCS engineer stated that hold up accumulations ranged from less than the minimum detectable amount to a couple hundred grams dry powder which does not normally pose a NCS concern in isolation. However, BLEU management did not express confidence in the hold-up measurements due to self-shielding, complex and unknown configurations, and lack of standards to validate the measurements. The licensee intends to obtain a better assessment of the hold-up remaining in the process prior to terminating the NCS controls or criticality accident alarm system coverage. Because the amount and the configuration of the SNM held-up in the process is not known, the criticality alarm system and NCS IROFS continue to be in effect in the process areas.

c. Conclusions

No safety concerns were identified during plant walkdowns.

## 6.0 Open Items

### IFI 70-143/2012-204-01

This item tracks completion of investigations and corrective actions associate with, and examination of, NDA methods suitable for wet uranium accumulations in process ventilation.

The licensee informed the inspectors that they were in the process of procuring NDA equipment capable of evaluating wet uranium in process ventilation but no action had been taken yet. The inspectors discussed the licensee's corrective actions with NDA and radiation protection personnel. They discussed the methods and equipment intended to be used to NDA wet uranium accumulations. Because the equipment hasn't been procured and the procedures for use haven't been completed this item remains open.

### IFI 70-143/2013-201-01

This item tracks completion of corrective actions identified as "long-term" in the Problem Identification, Resolution, and Correction System that involve programmatic non-compliance. The specific non-compliances (PIRCS # 798, PIRCS #37682, CA #797, and CA #19187) noted in the last inspection have not yet been resolved.

Overall the licensee is tracking just over 100 open corrective actions that are considered 'long-term;' this is down from about 850 several years ago. The licensee has made each safety discipline responsible for managing their long-term corrective actions. Since the last inspection the NCS manager has assembled a list of NCS related long-term corrective actions. He was able to close about half. As noted in the last inspection, some of these NCS related 'long-term' corrective actions actually concerned non-compliances that had been inappropriately filed as 'long-term.' The licensee is screening the list to identify and prioritize resolving those that involve non-compliances. Once the long-term PIRCS that involve non-compliances have been prioritized, the due dates will be changed to correct the issue in an appropriate time period. The inspectors reviewed aspects of the following documents:

- CA #713, "Revise Sample Packaging NCSE," dated December 5, 2003.
- CA #749, "Revise Interaction NCSE as needed." dated January 9, 2004.
- CA #750, "Revise Interaction NCSE as needed." dated January 9, 2004.
- CA #751, "Revise Interaction NCSE as needed." dated January 9, 2004.
- CA #756, "Revise 6-inch column NCSE as needed." dated January 9, 2004.
- CA #813, "Recovery Cooling Water NCSE," dated January 26, 2004.
- CA #816, "Revise Cooling/Process Water NCSE as appropriate," dated January 26, 2004.
- CA #1438, "Update Recovery Cooling Water NCSE as appropriate." dated August 25, 2004.
- CA #2171, "Revise the Area 700 NCSE..." dated May 6, 2005.
- CA #3515, "Revise ventilation NCSE as appropriate," dated June 28, 2006.
- NFS-CAP-009, "The NFS Corrective Action Program," Rev. 2, dated April 22, 2013.
- PIRCS #1563, dated December 4, 2003.
- PIRCS #1685, dated January 6, 2004.

- PIRCS #1686, dated January 6, 2004.
- PIRCS #1692, dated January 6, 2004.
- PIRCS #1807, dated January 22, 2004.
- PIRCS #1810, dated January 22, 2004.
- PIRCS #3069, dated August 16, 2004.
- PIRCS #4986, dated May 6, 2005.
- PIRCS #8012, dated June 22, 2006.

The inspectors reviewed a sample of the closed items to ensure that non-compliances were being resolved. CA # 713 was issued to resolve PIRCS #1563. These items were opened following an NCS audit in 2004 and documented an editorial observation. These items were closed, because the observation wasn't a non-compliance and nothing required correction. CA #749, CA #750, and CA #751 were the corrective actions for the issues documented in PIRCS #1685, and PIRCS #1686. An NCS audit had observed that the interaction NCSE could be updated to reflect the location of non-fissile equipment. These items were closed, because they don't concern a significant effect on reactivity or the safety basis. CA #2171 and PIRCS #4986 were closed in January 2012, but the NCSE they discuss was revised in June 2008, to address their concern. So these items should have been closed then, but they were missed and left open until January 2012.

The inspector also reviewed a sample of the items that had been left open pending prioritization and resolution; or further investigation by the licensee to justify closing them. CA #813 and PIRCS #1807 relate to a discrepancy between the NCSE and the operating procedure. CA #816 and PIRCS #1810 relate to equipment not being listed as safety related equipment. CA #1438 and PIRCS #3069 relate to one of the pieces of the same equipment not being uniquely specified in the administrative control as requiring periodic inspection.

IFI 70-143/2013-201-01 remains open to track the licensee's ongoing efforts to address long-term corrective actions involving non-compliances.

## **7.0 Exit Meeting**

The inspector presented the inspection results to members of the licensee's management and staff during an exit meeting on June 13<sup>th</sup> 2013. The licensee acknowledged and understood the findings as presented.

## SUPPLEMENTARY INFORMATION

### 1.0 List of Items Opened, Closed, and Discussed

#### Items Opened

**URI 70-143/2013-203-01**                      Lack of a detailed justification for why changes do not require a license amendment

#### Items Closed

None

#### Items Discussed

**IFI 70-143/2013-201-01**                      This item tracks completion of corrective actions identified as “long-term” in the Problem Identification, Resolution, and Correction System that involve programmatic non-compliance.

**IFI 70-143/2012-204-01**                      This item tracks completion of investigations and corrective actions associate with, and examination of, NDA methods suitable for wet uranium accumulations in process ventilation.

### 2.0 Inspection Procedures Used

IP 88015                      Nuclear Criticality Safety Program  
IP 88016                      Nuclear Criticality Safety Evaluations and Analyses

### 3.0 Key Points of Contact

#### NFS

N. Brown                      Manager, NCS  
R. Droke                      Senior Regulatory Advisor  
M. Elliott                      Director, Safety & Security  
D. Gardner                      Licensing  
J. Henry                      President, Nuclear Fuel Services, Inc.  
M. Lee                      Licensing Specialist  
R. Maurer                      Engineer, NCS  
M. Moore                      Environmental Protection & Industrial Safety Manager  
R. Shackelford                      Manager, Nuclear Safety & Licensing

#### NRC

G. Chapman                      Criticality Safety Inspector, NRC Headquarters  
T. Sippel                      Criticality Safety Inspector, NRC Headquarters

P. Glenn                      Fuel Facility Inspector, Region II  
C.Stancil                      Sr. Resident Inspector, Region II

All attended the exit meeting on June 13, 2013.

#### **4.0     List of Acronyms and Abbreviations**

ACA	Apparent Cause Analysis
ADU	ammonium diuranate
BLEU	blended low-enriched uranium
BPF	BLEU preparation facility
CA	corrective action
CAAS	Criticality Accident Alarm System
CAP	corrective action program
CCE	configuration controlled equipment
CDL	commercial development line
EPB	Effluent Processing Building
HEU	high-enriched uranium
HEPA	high-efficiency particulate air
IFI	inspector follow-up item
IP	inspection procedure
ISA	integrated safety analysis
NCS	nuclear criticality safety
NCSE	nuclear criticality safety evaluation
NDA	non-destructive assay
NFS	Nuclear Fuel Services, Inc. (licensee)
NUN	natural uranium nitrate
OCB	Oxide Conversion Building
PIRCS	Problem Identification, Resolution, and Corrective System
QA	Quality Assurance
SOP	Standard Operating Procedure
SRE	safety related equipment
SNM	Special Nuclear Material
UNB	Uranyl Nitrate Building
WWTF	wastewater treatment facility