



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

April 29, 2016

Mr. Joel W. Duling
President
Nuclear Fuel Services, Inc.
P. O. Box 337, MS 123
Erwin, TN 37650

SUBJECT: NUCLEAR FUEL SERVICES, INC. – U. S. NUCLEAR REGULATORY
COMMISSION INTEGRATED INSPECTION REPORT NUMBER 70-143/2016-002
AND NOTICES OF VIOLATION

Dear Mr. Duling:

This letter refers to the inspections conducted from January 1 to March 31, 2016, at the Nuclear Fuel Services, Inc. (NFS) facility in Erwin, TN. The purpose of these inspections was to determine whether activities authorized under the license were conducted safely and in accordance with U.S. Nuclear Regulatory Commission (NRC) requirements. The enclosed report presents the results of the inspections. The findings were discussed with members of your staff at the exit meetings held on January 28, February 4, 23, and 26, March 23, and at the end of the quarter on April 7, 2016.

During the inspections, NRC staff examined activities conducted under your license, as they related to public health and safety and to confirm compliance with the Commission's rules and regulations and with the conditions of your license. Areas examined during the inspections are identified in the enclosed report. Within these areas, the inspections consisted of selected examination of procedures and representative records, observations of activities, and interviews with personnel. The inspections covered the following areas; safety operations, radiological controls, facility support, and other areas.

Based on the results of the inspections, the NRC has determined that two Severity Level IV violations of NRC requirements occurred. These violations were evaluated in accordance with the NRC Enforcement Policy. The current Enforcement Policy is included on the NRC's Web site at (<http://www.nrc.gov/about-nrc/regulatory/enforcement/enforce-pol.html>). The violations are cited in the enclosed Notices of Violation (NOVs). NOVs and the circumstances surrounding them are described in detail in the subject inspection report.

The first violation associated with the failure to have required fire protection records available for all inspections, tests, and maintenance of the fire protection systems and components is being cited in the enclosed NOV because the NRC identified the violation.

You are required to respond to the first violation and should follow the instructions specified in the enclosed NOV when preparing your response. If you have additional information that you believe the NRC should consider, you may provide it in your response to the NOV. The NRC review of your response to the NOV will also determine whether further enforcement action is necessary to ensure compliance with regulatory requirements.

If you contest the violation, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-0001, with copies to: (1) the Regional Administrator, Region II; (2) the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and (3) Charlie Stancil at the Nuclear Fuel Services facility.

The second violation associated with the failure to implement Configuration Management (CM) program requirements for installation of Area 800 Unit K is being cited in the NOV because it is considered self-revealing. The NRC has concluded that information regarding the reason for the violation, the corrective actions taken and planned to correct the violation and prevent recurrence, and the date when full compliance will be achieved, is already adequately addressed in the enclosed inspection report. Therefore, you are not required to respond to the NOV unless the description herein does not accurately reflect your corrective actions or position. In that case, if you choose to provide additional information, you should follow the instructions specified in the enclosed NOV.

In accordance with Title 10 of the *Code of Federal Regulations* Section 2.390 of the NRC's "Rules of Practice and Procedure," 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 Agencywide Documents Access and Management System (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>.

Should you have any questions concerning these inspections, please contact David Hartland of my staff at 404-997-4722.

Sincerely,

/RA/

Marvin D. Sykes, Chief
Projects Branch 1
Division of Fuel Facility Inspection

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

Enclosures:

1. Notices of Violation
2. NRC Inspection Report 70-143/2016-002
w/Attachment: Supplementary Information

cc: (See page 3)

J. Duling

2

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Sincerely,

/RA/

Marvin D. Sykes, Chief
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w/Attachment: Supplementary Information

cc: (See page 3)

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NFS Website

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ACCESSION NUMBER: ML16120A113

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DATE	4/20/2-16	4/28/2016	4/28/2016	4/28/2016	4/28/2016	4/29/2016	4/29/2016
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NAME	NPitoniak	TSippel	PStartz				
DATE	4/27/2016	4/29/2016	4/28/2016				
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cc:

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BMPC – Core Manufacturing
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NOTICE OF VIOLATION

Nuclear Fuel Services, Inc.
Erwin, TN

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

During an NRC inspection conducted from February 1 to March 23, 2016, a violation of NRC requirements was identified. In accordance with the NRC Enforcement Policy, the violation is listed below:

SNM-124, Chapter 7 Fire Safety, Section 7.2.3 Inspection, Testing, and Maintenance of Fire Protection Systems, states in part, procedural guidance is established for the inspection, testing, and maintenance of fire protection systems routinely performed by NFS personnel. These procedures are applied to fire detection, warning, and suppression systems. Records of these activities and of outside vendor inspections are maintained by the Industrial Safety function. Section 7.4.1 Facility Design Criteria states in part, NFS buildings are designed and built to the requirements of NFPA 801, as well as, any applicable state, and local building, electrical, and fire codes in effect at the time of their construction.

NFPA 801, Section 4.4 Testing, Inspection and Maintenance, states in part, upon installation, fire protection systems and features shall be inspected and tested in accordance with the applicable standards or guidelines. Testing, inspection, and maintenance shall be documented by means of written procedures, with the results and follow-up actions recorded.

Individual NFPA Codes and Standards that define the requirements for testing, inspection and maintenance of the fire protection systems and components are referenced throughout NFPA 801. These NFPA Codes and Standards require that records be made for all inspections, tests, and maintenance of the system and its components and shall be made available upon request.

Contrary to the above, on or before February 3, 2016, the licensee was unable to, upon request, make available the records for all inspections, tests, and maintenance of the fire protection systems and components. Additionally, during a review of the available inspection, testing and maintenance records, the NRC inspectors identified multiple instances where fire protection system deficiencies had been identified, but no follow-up actions had been recorded indicating that these issues had been evaluated or addressed (e.g. corrective action documents, work requests, or other resolutions).

This is a Severity Level IV violation (Section 6.2).

Pursuant to the provisions of 10 CFR 2.201, Nuclear Fuel Services, Inc. is hereby required to submit a written statement or explanation to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with a copy to the Regional Administrator, Region II, within 30 days of the date of the letter transmitting this Notice of Violation. This reply should be clearly marked as a "Reply to a Notice of Violation"; and should include for each violation: (1) the reason for the violation, or, if contested, the basis for disputing the violation or severity level, (2) the corrective steps that have been taken and the results achieved, (3) the corrective steps that will be taken, and (4) the date when full compliance will be achieved. Your response may reference or include previous docketed correspondence, if the

Enclosure 1

correspondence adequately addresses the required response. If an adequate reply is not received within the time specified in this Notice of Violation, an order or a Demand for Information may be issued as to why the license should not be modified, suspended, or revoked, or why such other action as may be proper should not be taken. Where good cause is shown, consideration will be given to extending the response time.

If you contest this enforcement action, you should also provide a copy of your response, with the basis for your denial, to the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001.

Because your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document Agency Documents Access and Management System, accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> to the extent possible, it should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the public without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request withholding of such material, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim of withholding (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.390(b) to support a request for withholding confidential commercial or financial information). If safeguards information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21.

If Classified Information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR Part 95.

In accordance with 10 CFR 19.11, you may be required to post this NOV within two working days.

Dated this 29th day of April, 2016

NOTICE OF VIOLATION

Nuclear Fuel Services
Erwin, Tennessee

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

During an NRC inspection conducted January 25 through January 28, 2016, a violation of NRC requirements was identified. In accordance with the NRC Enforcement Policy, the violation is listed below:

Safety Condition S-1 of SNM License SNM-124, states, in part, that procedures be established and used in accordance with the statements, representations, and conditions in the application.

Section 11.1.3 of SNM-124 requires the implementation of the Configuration Management (CM) program be accomplished through procedures and instructions that delineate the responsibilities and actions of personnel to effectively implement the Configuration Program requirements.

NFS-CM-002, Identification and Control of Configuration Items, section 4.2.3 requires: "authorization to connect new installations to operating liquid, gas or ventilation piping and perform functional testing of equipment, following connection to these operating systems, shall be by letter of authorization (LOA)."

NFS-WM-001, Control and Execution of Work, Section 5.1 states, in part, that "complex work involving multiple phases/work sequences shall not be initiated using a single work request."

Contrary to the above, before September 27, 2015, the licensee failed to require the implementation of the CM program be accomplished through procedures and instructions that delineate the responsibilities and actions of personnel to effectively implement the Configuration Program Requirements. Specifically, the licensee (1) failed to authorize by LOA the connection of Area 800 Unit K to operating gas piping and failed to perform functional testing on this equipment following connection to operating systems as required by NFS-CM-002 and (2) failed to require that complex work involving multiple phases/work sequences not be initiated using a single work request as required by NFS-WM-001.

This is a Severity Level IV violation. (Section 6.7)

The NRC has concluded that information regarding the reason for the violation, the corrective actions taken and planned to correct the violation and prevent recurrence, and the date when full compliance will be achieved, is already adequately addressed in the enclosed inspection report. However, you are required to submit a written statement or explanation pursuant to 10 CFR 2.201 if the description therein does not accurately reflect your corrective actions or your position. In that case, or if you choose to respond, clearly mark your response as a "Reply to a Notice of Violation" and send it to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001 with a copy to the Regional Administrator, Region II, and a copy to the NRC Senior Resident Inspector, Charlie Stancil, at the Nuclear Fuel Services facility, within 30 days of the date of the letter transmitting this Notice of Violation.

If you choose to respond, your response will be made available electronically for public inspection in the NRC Public Document Room or in the NRC's Agencywide Documents Access and Management System (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>. Therefore, to the extent possible, the response should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the Public without redaction.

In accordance with 10 CFR 19.11, you may be required to post this Notice within two working days of receipt.

Dated this 29th day of April, 2016

U. S. NUCLEAR REGULATORY COMMISSION
REGION II

Docket No.: 70-143

License No.: SNM-124

Report No.: 70-143/2016-002

Licensee: Nuclear Fuel Services, Inc.

Facility: Nuclear Fuel Services, Inc.

Location: Erwin, TN 37650

Dates: January 1 through March 31, 2016

Inspectors: C. Stancil, Senior Resident Inspector
B. Adkins, Senior Fuel Facility Projects Inspector (Paragraphs A.3/5, C.4)
M. Crespo, Senior Fuel Facility Projects Inspector (Paragraph A.3)
D. Hartland, Senior Fuel Facility Projects Inspector (Paragraphs A.8, C.5)
L. Pitts, Senior Fuel Facility Projects Inspector (Paragraph A.8)
C. Rivera-Crespo, Fuel Facility Inspector (Paragraph C.4)
J. Gilliam, Fuel Facility Inspector (Paragraph A.8)
N. Pitoniak, Fuel Facility Inspector (Paragraph C.5)
T. Sippel, Fuel Facility Inspector (Paragraph A.5)
P. Startz, Fuel Facility Inspector (Paragraph C.4)

Approved by: M. Sykes, Chief
Projects Branch 1
Division of Fuel Facility Inspection

EXECUTIVE SUMMARY

Nuclear Fuel Services, Inc.
NRC Integrated Inspection Report 70-143/2016-006
January 1 – March 31, 2016

Inspections were conducted by the resident and regional inspectors during normal and off-normal hours in safety operations, radiological controls, facility support, and other areas. The inspectors performed a selective examination of licensee activities that was accomplished by direct observation of safety-significant activities and equipment, tours of the facility, interviews and discussions with licensee personnel, and a review of facility records. Two Severity Level (SL) IV violations (VIOs) of NRC requirements were identified.

Safety Operations

- Plant operations were performed safely and in accordance with license requirements. Items relied on for safety were properly implemented and maintained in order to perform their intended safety function. (Paragraphs A.1, A.2, and A.3)
- The Nuclear Criticality Safety program was implemented in accordance with the license application and regulatory requirements. (Paragraphs A.4 and A.5)
- With exception of one documented VIO, the Fire Protection program and systems were adequately maintained in accordance with the license application and regulatory requirements. One SL IV VIO of NRC requirements was identified for failure to have required records for the inspections, tests, and maintenance of the fire protection systems and components. (Paragraphs A.6, A.7 and A.8)

Radiological Controls

- The licensee adequately implemented the Radiation Protection program consistent with the license application and regulatory requirements. (Paragraphs B.1)

Facility Support

- The post maintenance testing and surveillance programs were implemented in accordance with the license application and regulatory requirements for work control and safety-related equipment testing. (Paragraphs C.1 and C.2)
- Adverse conditions were adequately identified, evaluated, and entered into the corrective action program. (Paragraph C.3)
- With exception of one documented violation, the Plant Modifications program was implemented in accordance with the license and regulatory requirements. A SL IV VIO of NRC requirements was identified for failure to perform functional testing on two Non-Configuration Management (CM) controlled isolation valves following the connection to a CM controlled operating system. (Paragraph C.4)
- The Emergency Preparedness program was implemented in accordance with the Emergency Plan and regulatory requirements. (Paragraph C.5)

Other Areas

- A meeting between the NRC and the licensee was held on February 26, 2016, to discuss the status of a previously identified violation VIO 2013-003-01, Failure to Comply with NFPA 101 Required 1.5 Hours Emergency Lighting System Test in accordance with licensee commitments in the license application. The licensee committed to revising their response to the VIO with an updated plan of action, schedule, and justification for continued operation.

Attachment:

Supplementary Information

REPORT DETAILS

Summary of Plant Status

The facility began and continued through the inspection period with the following process areas operating: Naval fuel manufacturing facility (FMF) and the Blended Low Enriched Uranium (BLEU) Preparation Facility (BPF) which includes the Uranium (U)-Metal, U-Oxide, Solvent Extraction and the down-blending lines.

A. Safety Operations

1. Plant Operations Routine (Inspection Procedures (IPs) 88135 and 88135.02)

a. Inspection Scope and Observations

The inspectors performed routine tours of plant operating areas housing special nuclear material (SNM) and determined that equipment and systems were operated safely and in compliance with the license. Daily operational and shift turnover meetings were observed throughout the period to gain insights into process safety and operational issues. The inspectors reviewed selected licensee-identified issues and corrective actions for previously identified issues. These reviews focused on plant operations, safety-related equipment (SRE) (valves, sensors, instrumentation, in-line monitors, and scales), and items relied on for safety (IROFS) to determine whether the licensee appropriately captured off-normal events and implemented effective corrective actions to prevent recurrence.

The routine tours included walk-downs of the FMF, BPF, commercial development line, miscellaneous storage areas, Building 234, and Building 440. During routine tours, the inspectors verified that operators were knowledgeable of their duties and attentive to any alarms or annunciators at their respective stations. The inspectors observed activities during normal and upset conditions for compliance with procedures and material station limits. The inspectors noted that safety controls, including IROFS, were in place, properly labeled, and functional to ensure proper control of SNM. The inspectors verified the adequacy of communications between supervisors and operators within the operating areas. The inspectors reviewed operator log books, standard operating procedures (SOPs), maintenance records, and Letters of Authorization (i.e., temporary procedures) to obtain information concerning operating trends and activities. The inspectors verified that the licensee actively pursued corrective actions for conditions requiring temporary modifications and compensatory measures.

The inspectors performed periodic tours of the outlying facility areas and determined that equipment and systems were operated safely and in compliance with the license. The inspectors focused on potential wind-borne missile hazards, potential fire hazards with combustible material storage and fire loading, hazardous chemical storage, the physical condition of bulk chemical storage tanks and piping, storage of compressed gas containers, and potential degradation of plant security features. In addition, the inspectors periodically toured or inspected the licensee's emergency response facilities for familiarization and to ensure the facilities were maintained in a readily available status.

The inspectors attended various plan-of-the-day meetings and met daily with the Plant Shift Superintendent 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 their approach to solving various plant problems during these meetings.

b. Conclusion

No violations of significance were identified.

2. Safety System Inspection (IP 88135.04)

a. Inspection Scope and Observations

The inspectors performed walk-downs of safety-significant systems involved with the processing of SNM. As part of the walk-downs, the inspectors verified as-built configurations matched approved plant drawings. The inspectors interviewed operators to confirm that plant personnel were familiar with the assumptions and controls associated with the IROFS systems and instrumentation for maintaining plant safety. The inspectors also verified that IROFS assumptions and controls were properly implemented in the field. The inspectors reviewed the related Integrated Safety Analysis (ISA) to verify system abilities to perform functions were not affected by outstanding design issues, temporary modifications, operator workarounds, adverse conditions, or other system-related issues. The inspectors also verified that there were no conditions that degraded plant performance and the operability of IROFS, safety-related devices, or other support systems essential to safety system performance. Safety significant FMF and BPF SNM storage were specifically inspected.

To determine the correct system alignment, the inspectors reviewed procedures, drawings, related ISAs, and regulatory requirements such as Title 10 of the *Code of Federal Regulations* (10 CFR) Section 70.61, "Performance Requirements." During the walk-downs, the inspectors verified all or some of the following as appropriate:

- Controls in place for potential criticality, chemical, radiological, and fire safety hazards
- Process vessel configurations maintained in accordance with Nuclear Criticality Safety (NCS) Evaluations
- Correct valve position and potential functional impacts such as leakage
- Electrical power availability
- Major system components correctly aligned, labeled, lubricated, cooled, and ventilated
- Hangers and supports correctly installed and functional
- Lockout/Tag-Out program appropriately implemented
- Cabinets, cable trays, and conduits correctly installed and functional
- Visible cabling in good material condition
- No interference of ancillary equipment or debris with system performance

b. Conclusion

No violations of significance were identified.

3. Plant Operations (IP 88020)

a. Inspection Scope and Observations

The inspectors interviewed staff and reviewed records associated with Area 800 and the tube cleaning room. The inspectors determined that the specific safety controls reviewed were being adequately implemented and properly communicated as described in the ISA. The inspectors determined that the licensee was operating the facility safely and in compliance with requirements.

The inspectors confirmed that engineered controls for Area 800 and the tube cleaning room were present and capable of performing their intended safety functions. To complete this confirmation, the inspectors verified the physical presence of passive and active engineered safety controls, evaluated the safety controls to determine their capability and operability, and verified that potential accident scenarios were covered.

The inspectors determined that licensee administrative controls were implemented and communicated. The inspectors reviewed various procedures and determined that required actions as identified in the ISA Summary have been correctly transcribed into written operating procedures. The inspectors evaluated the procedures' contents with respect to operating limits and operator responses for upset conditions and verified that limits needed to assure safety are adequately described in the procedures.

The inspectors interviewed various operators and determined that they were adequately implementing the required safety controls. The inspectors observed operator performance and determined that they were adhering to applicable safety procedures. The inspectors reviewed the postings applicable to the tasks being observed and determined that these postings were current, reflected safety controls, and were followed by the operators.

Thru interviews, document reviews and observations, the inspectors verified that the licensee conducted periodic surveillances as required by the ISA Summary for the selected safety controls. The inspectors also evaluated that the surveillances that identified IROFS that failed to pass were properly documented with appropriate corrective actions to return the control back to working order.

The inspectors reviewed the licensee's corrective action program (CAP) entries for the past 12 months and determined that deviations from procedures and unforeseen process changes affecting nuclear criticality, chemical, radiological, or fire safety were documented and investigated promptly. Also, the inspectors evaluated the corrective actions associated with selected CAP entries and determined that the completed corrective actions were adequate.

b. Conclusion

No violations of significance were identified.

4. Nuclear Criticality Safety (IP 88135.02)

a. Inspection Scope and Observations

During daily production area tours, the inspectors verified that various criticality controls were in place, that personnel followed criticality station limit cards, and that containers were adequately controlled to minimize potential criticality hazards. The inspectors reviewed a number of criticality-related IROFS for operability. The inspectors noted that operators were knowledgeable of the requirements associated with IROFS. The inspectors performed the tours inside various process areas when restrictions on SNM movements were in effect.

As part of routine day-to-day activities on-site, the inspectors reviewed CAP entries associated with criticality safety aspects. The inspectors evaluated the licensee's response to such entries and, if needed, had discussions with NCS engineers to determine safety significance and compliance with procedures.

b. Conclusion

No violations of significance were identified.

5. Nuclear Criticality Safety (IP 88015)

a. Inspection Scope and Observations

The inspectors evaluated the adequacy of the licensee's NCS evaluations to assure the safety of fissile material operations. The inspectors reviewed selected NCS documents (listed in Section 4.0 of the Attachment) to determine whether the criticality safety of risk-significant operations in Area 800 and BPF Solvent Extraction was assured through engineered and administrative controls, with adequate safety margin, preparation and review by qualified staff. The NCS evaluations and supporting documents reviewed demonstrated adequate identification and control of NCS hazards to assure operations within subcritical limits for normal and credible abnormal conditions through appropriate limits on controlled parameters. The inspectors interviewed the cognizant licensee NCS Engineers regarding their NCS Evaluations of these areas. The inspectors reviewed the NCS evaluations of selected NCS-related IROFS, in these areas, to determine whether the performance requirements and license commitments with respect to the double contingency principle were met for selected accident sequences.

The inspectors performed plant walkdowns in Area 800 and BPF Solvent Extraction to determine whether risk-significant fissile material operations were being conducted safely and in accordance with regulatory requirements. The inspectors verified that controls identified in the NCS Evaluations were installed or implemented (e.g. overflow drains in BPF Solvent Extraction) and that controls identified as IROFS were adequate to meet the performance requirements.

The inspectors accompanied a licensee NCS Engineer on a weekly walkdown and observed the walkdown of Area 800, BPF Solvent Extraction, and other areas in BPF. The inspectors noted that the walkdown was performed by an NCS engineer who reviewed the adequacy of control implementation; reviewed postings; and examined equipment and operations to verify that past evaluations remained adequate.

The inspectors reviewed the licensee's NCS program through interviews with licensee NCS engineers and management, and reviews of NCS program procedures to determine if license requirements are being implemented. The inspectors verified through interviews and by reviewing NCS evaluations, that the licensee's NCS evaluations are being written, reviewed, and approved by qualified NCS staff according to license requirements. The inspectors interviewed an NCS Engineer in-training, and the NCS manager about NCS qualification and verified that a trainee was not permitted to independently perform NCS-related tasks unless under the direction of a qualified NCS engineer. The inspectors verified that NCS staff reviewed potential changes that may impact NCS before the change is implemented. The inspectors reviewed qualification cards for three NCS engineers to verify that the NCS staff is qualified to perform their assigned duties. The inspectors reviewed recent NCS program audits to verify that the audits were completed in accordance with license requirements and that any identified findings were promptly entered into their corrective action system.

The inspectors reviewed records of criticality accident alarm system (CAAS) tests in order to confirm that the licensee was adequately maintaining the CAAS reliability. The inspectors reviewed the licensee response to a selection of recent internally-reported events, including CAAS related entries, identified in Section 4.0 of the Attachment. The inspectors interviewed licensee staff and observed that the events were investigated in accordance with the licensee's procedures governing the CAP and appropriate corrective actions were assigned and tracked to completion.

b. Conclusion

No violations of significance were identified.

6. Fire Protection Quarterly (IP 88135.05)

a. Inspection Scope and Observations

During routine plant tours, the inspectors verified that transient combustibles were being adequately controlled and minimized in selected process areas. Various fire barriers and doors were examined and found to be properly maintained and functional in accordance with site procedures. The inspectors reviewed active fire impairments in selected process areas and determined they were implemented per site procedure. Buildings 306W and 307 and Area 800 were specifically inspected.

The inspectors conducted a walk-down of Buildings 306W and 307 and determined that the Pre-Fire plan drawing matched the as-found condition for various fire protection components like extinguishers, sprinkler systems, and postings. The material condition of fire protection components was adequate. The inspectors noted the fire water supply to the surrounding area fire hydrants was properly aligned for operational status.

b. Conclusion

No violations of significance were identified.

7. Fire Protection Annual (IP 88135.05)

a. Inspection Scope and Observations

On March 3, 2016, the inspectors witnessed an announced fire brigade drill as part of the licensee's preparation for the Building 302 roof replacement. The inspectors specifically observed patient extraction, hose handling/charging, Stryker Chair exercises, and a Building 302 roof fire drill. Inspectors verified appropriate fire brigade leader command and control, proper donning and use of turnout gear and self-contained breathing apparatus (SCBA), sufficient availability of firefighting equipment, clear and effective radio communications, evacuation of unnecessary personnel, thorough investigation of the incident, and utilization of pre-planned strategies.

b. Conclusion

No violations of significance were identified.

8. Fire Protection Triennial (IP 88054)

a. Inspection Scope and Observations

The inspectors reviewed licensee programs, procedures, surveillances, maintenance, functional tests, drawings, and corrective action reports for the fire protection system to ensure that designated programs met license requirements and were adequate to preclude or mitigate the consequences of a fire.

The inspectors toured plant areas containing safety controls and IROFS to assess the material condition of fire protection equipment, systems, and features. Fire equipment locations were compared to the area Pre-Incident Plan to verify equipment locations as per required codes. The inspectors verified that flammable materials were stored in marked cabinets as specified in approved procedures and that housekeeping and the control of combustible materials were adequate and consistent with the approved procedures. Building exterior fire barriers were also inspected to ensure barrier integrity and verify no combustible storage in the areas.

The inspectors reviewed records and interviewed licensee personnel to verify that the observed fire protection systems were maintained in an adequate state of readiness and had been properly tested to verify their ability to perform their safety function. The inspectors determined that the fire pumps, fire dampers, doors, and penetration seals, with the exception of the violation identified below, were being maintained in a condition that would ensure they were available and reliable to perform their safety function. Also, the inspectors determined that fire hoses and portable extinguishers were provided at their designated locations and access was unobstructed.

The inspectors reviewed the licensee fire protection system out-of-service records and determined that adequate compensatory measures were put in place for out-of-service, degraded or inoperable fire protection equipment, systems or features except as identified below.

The inspectors verified that fire brigade training records and qualifications were up to date and members participated in drills at the appropriate frequency. The inspectors verified that Memorandums of Understanding (MOUs) for offsite fire support were in place and renewed/reviewed within the frequency specified in approved procedures.

The inspectors reviewed the licensee CAP entries for the past 12 months and determined that the licensee identified safety control for IROFS fire protection operability problems at an appropriate threshold and entered them into the CAP except as identified by the following violation:

Introduction: The NRC-identified a SL IV violation of Special Nuclear Material License SNM- 124, Chapter 7, "Fire Safety", Section 7.2.3 "Inspection, Testing, and Maintenance of Fire Protection Systems", for failure to have required records available for all inspections, tests, and maintenance of the fire protection systems and components, and Section 7.4.1 "Facility Design Criteria", for failure to record follow-up actions in accordance with referenced NFPA 801, Section 4.4 "Testing, Inspection and Maintenance." Specifically, the licensee could not produce and did not have complete records for Fire Protection systems surveillance, testing, inspection results, and follow-up actions.

Description: During the inspection the week of February 1, 2016, the inspectors identified that required records of the inspection, testing and maintenance of the licensee's fire protection systems and components could not be readily retrieved. The licensee entered this condition into their CAP as PIRCS P20915 "Review and Revise the Fire Protection Inspection/ test procedures".

Additionally, during a review of the available inspection, testing and maintenance records the NRC inspectors identified multiple instances where fire protection system deficiencies had been identified, but no follow-up actions had been recorded indicating that these issues had been evaluated or addressed (e.g. corrective action documents, work requests, or other resolutions). An example of a deficiency identified was Fire Door D344, a component of IROFS Fire-19, which had been inspected and tested per NFS-HS-B-95 on January 27, 2015 and found to be non-functional because of deficiencies in the latching mechanism and no records were found to demonstrate that follow up actions had been taken to address this deficiency before February 18, 2016. The function of D344 was to close and latch in the event of a detected fire in the immediate area in order to ensure the fire would not migrate into adjacent areas. During additional testing conducted on February 18, 2016, it was noted again that D344 would not latch. The licensee initiated WR 245781 to repair the door, the Fire System Impairment 2016-034 on February 19, 2016, to evaluate compensatory action. In addition, the licensee initiated PIRS 52932 to document this issue. The licensee satisfactorily retested D344 on March 22, 2016.

Following the identification of this noncompliance, the licensee performed a self-assessment which involved a review of all fire protection program inspection, testing, and maintenance procedures and records. During this self-assessment, the licensee either located the majority of the missing records or re-performed requisite procedures, and evaluated the discrepancies that brought system functionality or code-compliance into question. This licensee self-assessment did not identify any issues that would cause them to not meet 10 CFR 70.61 performance requirements. In addition, the licensee re-inspected and provided justification for the instances where fire protection system deficiencies had been identified.

The licensee concluded that the degradation of IROFS Fire-19 due to D344 failing to latch in the closed position did not result in the failure to meet the performance requirements of 10 CFR 70.61. The basis for the licensee's conclusions was Fire-19 being a bounded assumption of the fire scenario and uncredited mitigating factors being in place (roving security patrols, operators in the area, functional protection equipment, staffed fire brigade, and transient combustible material inspections).

The licensee's corrective actions included implementation of a new process to ensure required records and their revisions were retained and readily retrievable, required information was captured and promptly evaluated, issues were adequately addressed through the Corrective Action and Work Control programs.

Analysis: The licensee failed to have required records available for all inspections, tests, and maintenance of the fire protection systems and components. SNM-124, Chapter 7 Fire Safety, Section 7.2.3 Inspection, Testing, and Maintenance of Fire Protection Systems, requires that procedural guidance be established for the inspection, testing, and maintenance of fire protection systems routinely performed by NFS personnel. These procedures are applied to fire detection, warning, and suppression systems. Records of these activities and of outside vendor inspections are maintained by the Industrial Safety function. Section 7.4.1 Facility Design Criteria states in part, NFS buildings are designed and built to the requirements of NFPA 801, as well as, any applicable state, and local building, electrical, and fire codes in effect at the time of their construction. Individual NFPA Codes defining the requirements for the inspection, testing and maintenance of fire protection systems and components are referenced throughout NFPA 801. These NFPA codes require that the records associated with inspection testing and maintenance activities be retained and made available upon request to demonstrate compliance with the applicable code requirements. NFPA 801, Section 4.4 specifically required follow-up actions to be recorded.

This issue was determined to be more than minor because it aligned with Inspection Manual Chapter (IMC) 0616, "Fuel Cycle Safety and Safeguards Inspection Reports," Appendix B, "Examples of Minor Issues," screening question 3 which asked, "Is the noncompliance indicative of a programmatic deficiency?" Specifically, the inspectors identified multiple examples where the NFS fire protection program (1) failed to ensure records of the inspection, testing and maintenance of fire protection systems were readily retrievable, and (2) failed to establish or implement an adequate process for identifying and evaluating issues identified during inspection testing and maintenance and recording follow-up actions.

The inspectors reviewed the licensee's self-assessment associated with this violation and agreed that there were no issues identified that would have caused them to not meet 10 CFR 70.61 performance requirements.

In accordance with the NRC Enforcement Policy, violations that are less serious, but are of more than minor concern and resulted in no or relatively inappreciable potential safety or security consequences, are characterized as Severity Level IV violations.

Enforcement: SNM-124, Chapter 7 Fire Safety, Section 7.2.3 Inspection, Testing, and Maintenance of Fire Protection Systems, states in part, procedural guidance is established for the inspection, testing, and maintenance of fire protection systems routinely performed by NFS personnel. These procedures are applied to fire detection, warning, and suppression systems. Records of these activities and of outside vendor

inspections are maintained by the Industrial Safety function. Section 7.4.1 Facility Design Criteria states in part, NFS buildings are designed and built to the requirements of NFPA 801, as well as, any applicable state, and local building, electrical, and fire codes in effect at the time of their construction.

NFPA 801, Section 4.4 Testing, Inspection and Maintenance, states in part, upon installation, fire protection systems and features shall be inspected and tested in accordance with the applicable standards or guidelines. Testing, inspection, and maintenance shall be documented by means of written procedures, with the results and follow-up actions recorded.

Individual NFPA Codes and Standards that define the requirements for testing, inspection and maintenance of the fire protection systems and components are referenced throughout NFPA 801. These NFPA Codes and Standards require that records be made for all inspections, tests, and maintenance of the system and its components and shall be made available upon request.

Contrary to the above, before February 3, 2016, the licensee was unable to, upon request, make available the records for all inspections, tests, and maintenance of the fire protection systems and components, including recorded follow-up actions.

The inspectors determined that the actual safety significance was low because the licensee was able to demonstrate that this failure to ensure that requirements were met resulted in no or relatively inappreciable potential safety or security consequences.

The failure of the sites fire protection program to adequately maintain the required records for all inspections, tests, and maintenance of the fire protection systems and components is a Severity Level IV violation of NRC requirements and will be documented as VIO 70-143/2016-002-01, "Failure of the Fire Protection Program to Maintain Records of Inspection Testing and Maintenance of Fire Protection Systems and Components."

b. Conclusion

A Severity Level IV violation of NRC requirements was identified for failure to have required records available for all inspections, tests, and maintenance of the fire protection systems and components, and failure to implement. No other issues of significance were identified.

B. Radiological Controls

1. Radiation Protection Quarterly (IP 88135.02)

a. Inspection Scope and Observations

During tours of the production areas, the inspectors observed radiation protection controls and practices implemented during various plant activities including the proper use of personnel monitoring equipment, required protective clothing, and frisking methods for detecting radioactive contamination on individuals exiting contamination controlled areas. The inspectors noted that plant workers properly wore dosimetry and used protective clothing in accordance with applicable Special Work Permits (SWPs). The inspectors also noted that radiation area postings complied with plant procedures

and included radiation maps with up-to-date radiation levels. The inspectors monitored the operation of radiation protection instruments and verified calibration due dates.

The inspectors performed numerous partial reviews of SWPs during the inspection period in different operational areas, but conducted a more thorough review for the following SWPs and posted radiologically controlled areas:

- SWP 16246, Building 303-600 Area, Repair/Replace Zone 3/4 Elements In Addition to Other Repairs and Tent Removal, Confined Space Permit 1853
- SWP 160404, Area D, OD01/02 Catalyst Change Out
- SWP 16290, Replacement of Building 302 Office Area Roof Including Removal of Existing Roof System and Structural Deck

b. Conclusion

No violations of significance were identified.

C. Facility Support

1. Post Maintenance Testing (IP 88135.19)

a. Inspection Scope and Observations

The inspectors witnessed and reviewed the post-maintenance tests (PMTs) listed below to verify that procedures and test activities confirmed safety systems and components (SSCs) operability and functional capability following the described maintenance. The inspectors reviewed the licensee's completed test procedures to ensure any of the SSC safety function(s) that may have been affected were adequately tested, that the acceptance criteria were consistent with information in the applicable licensing basis and/or design basis documents, and that the procedure had been properly reviewed and approved. The inspectors also witnessed and/or reviewed the test data to verify that test results adequately demonstrated restoration of the affected safety function(s). The inspectors verified that PMT activities were conducted in accordance with applicable work order instructions or licensee procedural requirements. Furthermore, the inspectors verified that problems associated with PMTs were identified and entered into the licensee's Problem, Identification, Resolution, and Correction System (PIRCS).

- Work Request 245005, Replace Vibrator VIBTRX-AL01, PMT per SOP 401-41, Steps 6.1.7, 6.1.24, 6.1.38
- Work Request 240359, Modification of Downblending PLC Code, PMT per Test Plans DB PLC U-235 g/L Equation Parameters TP-2015-17 Installation Qualification and TP-2015-18 Operations Qualification, SRE Test N333MONITRE4B11, Engineering Change Request (ECR)-20151029-01, CCP-20160011

b. Conclusion

No violations of significance were identified.

2. Surveillance Testing (IP 88135.22)

a. Inspection Scope and Observations

The inspectors witnessed portions of and/or reviewed completed test data for the following surveillance tests of risk-significant and/or safety-related systems to verify that the tests met the requirements of the ISA, commitments, and licensee procedures. The inspectors confirmed the testing effectively demonstrated that the SSCs were operationally capable of performing their intended safety functions and fulfilled the intent of the associated SRE test requirement.

The inspectors discussed surveillance testing requirements with operators performing the associated tasks and determined that their procedural knowledge was adequate. The inspectors verified that any test equipment or standards used to conduct the test were within calibration. The inspectors determined that effective communications between personnel performing these tests were used to complete each activity.

- SRE Tests N302WIRES33ZON4 and N303WIRES33ZON3, Fire Protection IROFS Protecto-Wire for Securing of Bulk Chemical Pump
- SRE Test NJCLHFLOFCVHL01, Liquid Hydrogen Excess Flow Check Valve

b. Conclusion

No violations of significance were identified.

3. Corrective Action Program (CAP) Review (IP 88135)

a. Inspection Scope and Observations

The inspectors reviewed the PIRCS to ensure that items adverse to safety were being identified and tracked to closure in accordance with program procedures. The inspectors routinely attended daily PIRCS screening committee meetings and periodic Corrective Action Review Board meetings to evaluate site management's response and assignment of corrective actions or investigations to various issues. The inspectors also performed daily screenings of items entered into the CAP to aid in the identification of repetitive equipment failures or specific human performance issues for follow-up.

The inspectors reviewed CAP entries that occurred during the inspection period to assess and evaluate the safety significance of issues. For items identified to be more safety significant, the inspectors conducted an additional evaluation to verify the licensee was adequately addressing and correcting the issues to prevent recurrence.

Furthermore, the inspectors conducted periodic reviews of licensee audits and third-party reviews of safety significant processes to determine their effectiveness and whether the licensee entered results into PIRCS. Specifically the inspectors reviewed the following:

- Facilitated 2015-2016 Winter Outage Return-to-Work Evolutions, Presentations, and Training
- NFS Quarterly Assessment of Radioactive Liquid & Gaseous Effluents, Fourth Quarter 2015

b. Conclusion

No violations of significance were identified.

4. Plant Modifications (IP 88070)

a. Inspection Scope and Observations

The inspectors interviewed the CM Section Manager and his staff members to verify that the licensee had established an effective CM system to evaluate, implement, and track permanent plant modifications to the site which could affect safety. The CM system had adequate provisions to ensure that plant modifications did not degrade the performance capabilities of items relied on for safety or other safety controls that are part of the safety design basis.

The inspectors verified that the licensee addressed the impacts of modifications to the ISA, ISA Summary, and other safety program information developed in accordance with 10 CFR 70.62.

The inspectors reviewed the licensee's problem identification and resolution program to verify that issues relating to plant modifications were entered into the CAP. The inspectors also evaluated the adequacy of corrective actions.

The inspectors reviewed selected change control packages and reviewed implementing procedures to evaluate the adequacy of the CM procedures. Specifically, the inspectors reviewed ECR-2015-0185, ECR-2014-1546-04, and ECR-2014-1546 related to the installation of a new unit in Area 800. Inspectors also evaluated the test calcination of new types of particulate filter cartridges through the existing 301 Receipt Calciner. The inspectors performed through physical inspections of the production lines along with the targeted plant modifications to validate the as-found plant configuration was in agreement with drawings and documentation. Set point evaluations were accurately completed, reviewed, validated, and approved in accordance with applicable procedures.

The inspectors reviewed an internal event associated with the installation of a new unit in Area 800 in which a leak occurred through the unions of two new isolation valves causing an airborne release of material.

Introduction: The inspectors identified a self-revealing cited SL IV violation of Special Nuclear Material License SNM-0124, for failure to follow Section 11.1.3 of the license which requires that the implementation of the CM Program be accomplished through procedures and instructions that delineate the responsibilities and actions of personnel to effectively implement the CM Program elements. Specifically, the inadequate control of the installation of Unit K in Area 800 resulted in potentially exposing an operator to an unplanned radiological release.

Description: A new unit (Unit K) in area 800 was authorized to be installed on March 19, 2015 through a change authorization in accordance with licensee procedures. The existing off-gas system did not have valves that could be used as isolation for tie-in of the new Unit K, therefore, the work scope included the installation of two new isolation valves to provide the necessary isolation between Unit K and the common off-gas header. The installation of the new unit and the tie-in into the existing common off-gas

header required a work package and an approved letter of authorization (LOA) in accordance with licensee procedures. The LOA was approved and effective on September 16, 2015, but did not require that the newly installed isolation valves be functionally tested prior to restart of the common off-gas system. The work request was approved on April 1, 2015, but lacked details of specific work activities to be performed during the tie-in and did not require functional testing of the two new isolation valves. In addition, the work request had a hand written note stating that a separate work request was needed for the tie-in of Unit K into the operating off-gas system. The purpose of the second work request was to provide the necessary requirements for system tie-in including functional testing; however, a separate work request was never issued. Therefore, on September 27, 2015 Unit K was connected to the operating off-gas system and the valves were installed without completing the required functional testing.

On Sunday September 28, 2015, while conducting normal operations in an adjacent unit, an operator pressurized the common off-gas header. He noted a “puff” coming out from the new isolation valves. The “puff” was off-gas material released into the room via the loose unions on the top of the valves. The area was isolated and the licensee performed air samples and smears. The initial high volume air sample exceeded the administrative limit for the area; however, after a few minutes of recycling the air in the room, a follow-up evaluation demonstrated that there were no exposure concerns for the operators. The licensee performed nasal smears on the operators and no measurable uptake was noted. After the event, the licensee conducted a root cause investigation.

Analysis: The failure to follow Section 11.1.3 of License SNM-0124 was determined to be a violation of NRC requirements. Based on the NRC’s review, the inspectors determined that NFS failed to implement procedures and instructions that delineate the responsibilities and actions of personnel to effectively implement the CM program elements. Specifically, NFS failed to implement the necessary CM controls to ensure that the Unit K isolation valves were functionally tested prior to using the valves as part of the pressure boundary for an adjacent unit under CM control. The inspectors determined that the violation was self-revealing because it was identified through an event that resulted in an unplanned release of radioactive material to the process room during normal operations.

Specifically, NFS failed to follow the following CM procedures and instructions as evidenced by the following examples:

- Example 1: NFS failed to include instructions in the LOA to perform functional testing of the new Unit K isolation valves following connection to the operating system as required by Section 4.2.3 of NFS-CM-002, Identification and Control of Configuration Items.
- Example 2: NFS failed to meet NFS-WM-001, Control and Execution of Work, Section 5.1 which states that “Complex project work that is considered a ‘Change’ to plant Systems, Structures, or Components, involving multiple phases/work sequences shall not be initiated using a single work request.”

The inspectors determined that the actual safety significance was very low because the event did not result in any radiological consequences that exceeded regulatory limits or resulted in the failure to meet 70.61 performance requirements. However, the violation was found to be more than minor based on the following screening questions found to

be applicable in IMC 0616, "Fuel Cycle Safety and Safeguards Inspection Reports." Screening question 1 states, "Could the noncompliance reasonably be viewed as a precursor to a significant event?" The inspectors determined that the failure to follow the CM procedures and instructions was considered a potential precursor to a significant event. Specifically, the noncompliance was determined to be a contributing factor that led to an unplanned release of radioactive material to the process area. Based on their review, the inspectors determined that the actual consequences could have been more significant if it had occurred in a different area with higher concentrations of SNM; therefore, while this process leak did not result in an actual radiological consequence to the worker, the NRC determined that the leak was a near miss. In general, the NRC does not consider fortuitous happenstance and coincidence (e.g., luck) when determining the significance of violations related to worker health and safety from exposure to radiation.

In addition, the inspectors considered screening question 4 of IMC 0616, Appendix B, "Does the noncompliance represent more than a paperwork issue (e.g., resulted in a physical impact on the plant) that adversely impacted personnel or nuclear safety?" The inspectors determined that the noncompliance represented more than a paperwork issue that resulted in an unplanned radiological release that had the potential to impact personnel and/or nuclear safety. The inspectors concluded that if this event had occurred in a different system with more significant quantities of SNM, the potential radiological/chemical consequences to the worker could have been more significant than what actually occurred.

In accordance with the NRC Enforcement Policy, violations that are less serious, but are of more than minor concern, and result in no or relatively inappreciable potential safety or security consequences are characterized as Severity Level IV violations.

Enforcement: Safety Condition S-1 of SNM License SNM-124, states, in part, that procedures be established and used in accordance with the statements, representations, and conditions in the application.

Section 11.1.3 of SNM-124 requires the implementation of the CM program be accomplished through procedures and instructions that delineate the responsibilities and actions of personnel to effectively implement the Configuration Program requirements.

NFS-CM-002, Identification and Control of Configuration Items, Section 4.2.3 requires: "authorization to connect new installations to operating liquid, gas or ventilation piping and perform functional testing of equipment, following connection to these operating systems, shall be by letter of authorization."

NFS-WM-001, Control and Execution of Work, Section 5.1 states, in part, that "complex work involving multiple phases/work sequences shall not be initiated using a single work request.

Contrary to the above, before September 27, 2015, the licensee failed to require the implementation of the CM program be accomplished through procedures and instructions that delineate the responsibilities and actions of personnel to effectively implement the Configuration Program Requirements. Specifically, the licensee (1) failed to authorize by LOA the connection of Area 800 Unit K to operating gas piping and failed to perform functional testing on this equipment, following connection to operating systems as required by NFS-CM-002 and (2) failed to require that complex work

involving multiple phases/work sequences not be initiated using a single work request as required by NFS-WM-001.

The inspectors determined that the actual and potential safety significance was very low because the unplanned release of radioactive materials did not result in any radiological consequences that exceeded regulatory limits or resulted in the failure to meet 70.61 performance requirements. However, the violation was found to be more than minor based on Screening Questions 1 and 4 of IMC 0616, Appendix B.

The licensee performed a root cause investigation under PIRCS 12001 and identified corrective actions to prevent recurrence. The licensee's corrective actions included the following: (1) modify the CM implementing procedures to include instructions on how to connect new equipment to an existing CM controlled systems; (2) provide training on decision making, questioning attitude and formality and discipline to Project Engineering, CM, Work Management personnel; and to Operations Supervisors and Management regarding this event.

The failure to authorize connection of new isolation valves and associated piping and perform functional testing following connection to an operating system is a Severity Level IV violation of NRC requirements, VIO 70-143/2016-002-02, "Failure to Perform Functional Testing on Two Non-CM Controlled Isolation Valves Following the Connection to a CM Controlled Operating System." In accordance with Section 2.3.3 of the NRC Enforcement Policy, the NRC is waiving the need for a formal written response to the violation based on the NRC's review of corrective actions to correct the noncompliance during the inspection.

b. Conclusion

A Severity Level IV violation of NRC requirements was identified for failure to perform functional testing on two Non-CM controlled isolation valves following connection to a CM controlled operating system. No other findings of significance were identified.

5. Emergency Preparedness (IP 88050)

a. Inspection Scope and Observations

The inspectors interviewed staff and reviewed records and determined that any changes made to the Emergency Plan or within the facility had been properly coordinated within the Emergency Preparedness (EP) program. The inspectors reviewed procedures with significant revisions since the last emergency preparedness inspection and determined that the changes were in compliance with the Emergency Plan. The inspectors discussed the licensee emergency call list and verified that the list was current.

The inspectors reviewed training records and interviewed licensee staff regarding emergency preparedness training in the past year. The inspectors determined that the EP requirements were in compliance with the Emergency Plan. The inspectors verified that the licensee conducted training for their personnel and provided emergency equipment as required by the Emergency Plan and that the individuals responsible for utilizing the equipment were qualified. The inspectors verified that the licensee provided training to hypothetical emergency situations which were effective and consistent with the frequency and performance objectives required in the Emergency Plan. The

inspectors conducted an interview with the most recently qualified Emergency Control Director and evaluated response to a postulated emergency scenario.

The inspectors reviewed the written agreements with the off-site agencies and verified that the organizations required by the Emergency Plan had up-to-date agreements. The inspectors reviewed records and verified that the licensee invited off-site organizations for training as required by the Emergency Plan and determined that the training given was appropriate. The inspectors noted that several off-site organization training sessions were conducted since the previous inspection and were attended by multiple representatives from the Unicoi County Emergency Management Agency, the Southside Volunteer Fire Department, the Johnson City Fire Department, the Tennessee Department of Health, MEDICONE Emergency Medical Service, the Erwin Fire Department, the Tennessee Emergency Management Agency, Wings aeromedical transport service, the Northeast Regional Health Office, the Unicoi County Medical Center, and the NFS registered nurse staff. The inspectors reviewed records and verified that the licensee performed communications checks with the off-site organizations at a quarterly frequency as required by the Emergency Plan.

The inspectors observed the storage of emergency equipment in the Emergency Control Center (ECC), the Emergency Monitoring Supply Center (EMSC), and building 350 and verified that the inventory levels were maintained as required by the Emergency Plan. The inspectors toured the ECC and EMSC verified that they were readily assessable and maintained the appropriate amount of communication equipment. The inspectors reviewed the accountability procedure and verified that accountability meeting points were assessable.

The inspectors accompanied licensee personnel and observed the collection of two off-site monitoring air samples.

The inspectors reviewed the self-assessments generated since the last inspection and verified that a system was in place for adequately tracking and resolving self-assessment findings.

b. Conclusion

No violations of significance were identified.

D. Other Areas

1. Follow-up on Previously Identified Issues

- a. (Discussed) Severity Level IV Violation (VIO) 70-143/2013-003-01, Failure to Comply with NFPA 101 Required 1.5 hours Emergency Lighting System Test in accordance with Licensee Commitments in the License Application

Background

On June 12, 2013, the licensee discovered that the 1.5 hour functional test of the emergency lights required by NFPA 101, Life Safety Code, 2009 edition, was not being

performed. The licensee authorized a deviation from the code. The inspectors reviewed the licensee documentation and concluded that requisite testing had not been performed and that the licensee did not have the authority to make a code deviation decision. Details of the VIO are documented in NRC Inspection Report 70-143/2013-003.

Meeting Discussion

On February 26, 2016 at the NFS plant site, a meeting occurred between NRC Region II representatives and licensee management concerning the status of NRC VIO 2013-003-01. Fundamentally, the licensee accepted that a code deviation should not have been authorized, and as allowed by the NFPA code, should have been documented as an equivalency. The licensee later revised their documentation to justify an equivalency which the NRC did not accept both through a continuing dialogue and during a 2015 NRC fire protection inspection. The NRC stated that the majority of the licensee's equivalent package of protection was not specific to the emergency lighting function, and therefore unacceptable.

The licensee stated that there were over 300 emergency lights in SNM bearing buildings that would more than meet the required candle power for emergency egress, although an analysis to determine the minimum number of lights was not performed. Additionally, the licensee stated that there was some indication from the emergency lighting manufacturer that a monthly test of longer than 30 seconds could bound a much shorter egress time than the 90 minute code requirement. The NRC agreed that a combination of expanding and justifying the monthly emergency light test for the requisite egress time and determining the minimum number of lights necessary for each area could be an adequate justification for equivalency. The licensee committed to revising and resubmitting the previous VIO response with an updated plan and schedule of action. The NRC stated that, in addition, the revised submittal should provide a justification for continued operation including all interim actions, both completed and planned, to show the site was safe from the point at which this issue was identified to the present.

E. Exit Meetings

The inspection scope and results were presented to members of the licensee's staff at various meetings throughout the inspection period and were summarized on January 28, February 4, 23, and 26, March 23, and at the end of the quarter on April 7, 2016, to J. Duling and his staff. No dissenting comments were received from the licensee. Proprietary and classified information was discussed but not included in the report.

SUPPLEMENTARY INFORMATION

1. KEY POINTS OF CONTACT

<u>Name</u>	<u>Title</u>
S. Barron	Emergency Preparedness Manager
C. Brown	MC&A Department Section Manager
N. Brown	NCS Department Section Manager
T. Cloyd	Fire Protection Engineer
R. Dailey	Engineering Director
R. Dotson	Quality Manager
J. Duling	President
T. Evans	Security Section Manager
R. Freudenberger	Safety & Safeguards Director
J. Hagemann	Work Management Section Manager
M. McKinnon	Operations Director
M. Moore	Environmental Protection & Industrial Safety Section Manager
J. Nagy	Nuclear Safety Officer Chief
R. Rice	Radiation Protection Unit Manager
D. Rogers	Waste Management & Decommissioning Section Manager
A. Sabisch	Licensing and ISA Manager
S. Sanders	Training Manager
R. Shackelford	Nuclear Safety & Licensing Section Manager
R. Storey	Configuration Management Unit Manager

2. LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

70-143/2016-002-01	VIO	Failure of the Fire Protection Program to Maintain Records of Inspection Testing and Maintenance of Fire Protection Systems and Components. (Paragraph A.8.a.1))
70-143/2016-002-02	VIO	Failure to Perform Functional Testing on Two Non-Configuration Management (CM) Controlled Isolation Valves Following the Connection to a CM Controlled Operating System. (Paragraph C.4)

Discussed

70-143/2013-003-01	VIO	Failure to Comply with NFPA 101 Required 1.5 Hours Emergency Lighting System Test In Accordance with Licensee Commitments in the License Application (Paragraph D.1)
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3. INSPECTION PROCEDURES USED

88015	Nuclear Criticality Safety
88020	Operational Safety
88050	Emergency Preparedness
88054	Fire Protection Triennial
88070	Permanent Plant Modifications

88135	Resident Inspection Program For Category I Fuel Cycle Facilities
88135.02	Plant Status
88135.04	ISA Implementation
88135.05	Fire Protection
88135.19	Post Maintenance Testing
88135.22	Surveillance Testing

4. **DOCUMENTS REVIEWED**

Drawings:

306-F0268-D; dated September 10, 2015

306-F0269-D; dated February 26, 2015

307-F0378-D, Revision (Rev.) 0, Area 800 Unit K Temperature Control P&ID.

Procedures:

54T-09-0076, Control Flowdown and Field Verification for BPF Solvent Extraction, Rev. 9

ENG-ESP-A-003, Setpoint Verification and Design Parameter Documentation, Rev. 7

IROFS 300-GENERAL, Rev 0

IROFS 301-UTILMCA, Rev. 4

IROFS 302-100-200; Rev 4

IROFS 302-EURECOV, Rev. 1

IROFS 302-FGHIJURECOV, Rev. 1

IROFS 302-900, Rev 1

IROFS 302-DURECOV, Rev. 1

IROFS 302-300400500, Rev. 2

IROFS 302-100-200, Rev. 2

IROFS 302-FGHIJURECOV, Rev. 3

IROFS 303-900, Rev. 1

IROFS 306-307-800, Rev 2

IROFS 000-FACILITY SUPPORT, Rev. 4

IROFS 306-307-800, Rev. 1

IROFS 333-USVXTR, Rev. 3

NFS 300 Complex Production ISA Summary

NFS Site ISA Summary

NFS Special Nuclear Materials License SNM-124

NFS-CAP-9, The NFS Corrective Action Program, Rev. 5

NFS-CAP-9-1, Corrective Action Program (CAP) Screening Process, Rev. 2

NFS-CAP-10, Assigning & Performing Effectiveness Evaluations, Rev. 0

NFS-CM-2, Identification and Control of Configuration Items (CIs), Rev. 6

NFS-CM-4, NFS Change Control Process, Revs. 15 and 16

NFS-CM-5, NFS Change Control Board, Rev. 7

NFS-ENG-1, Engineering Project Design Control, Rev. 13

NFS-ENG-88, Change Authorization, Rev. 6

NFS-ENG-EPS-A-1, Engineering Practices and Standards-Project Execution, Rev. 7

NFS-ENG-EPS-1, Engineering Practices and Standard Project Execution, Rev. 6

NFS-ENG-HTG-35, Preparation of Technical Bases Documentation for Engineering Change request, Rev. 2

NFS-GH-27, Impairments to Fire Protection Systems, Rev. 11

NFS-GH-43, Safety Related Equipment Control Program, Rev. 25

NFS-GH-44, Evaluation and Implementation of Internally Authorized Changes (IACs), Rev. 15

NFS-GH-44-F, Notification of IAC Completion, Rev. 1, dated December 8, 2015
 NFS-GH-44-F, IAC-Safety Analysis, Rev. 0, dated December 15, 2015
 NFS-GH-57, Fire Brigade Organization and Administration, Rev. 6
 NFS-GH-96, Fire Barrier Program, Rev. 0
 NFS-GH-900, Safety and Safeguards Review Council (SSRC) Program, Rev. 21
 NFS-GH-901, Configuration Management Program, Rev. 19
 NFS-GH-903, Emergency Plan, Rev. 20
 NFS-GH-932, ALARA Program
 NFS-HS-A-68, ISA Risk Assessment Procedure, Rev. 6
 NFS-HS-A-104, Testing/ Inspection of Fire Barrier Systems, Rev. 3
 NFS-HS-B-9, Dosimeter Use and Exchange, Rev. 16
 NFS-HS-B-20, Routine Sampling of Environmental Media, Rev. 23
 NFS-HS-B-32, Special Air Sample Record (Attachment A), dated September 28, 2015
 NFS-HS-B-95, Testing/ Inspection of Fire Barrier Systems, Rev. 3
 NFS-HS-CL-10-00, Nuclear Criticality Safety Buildings 302/303/304/306/307 Miscellaneous Stations
 NFS-HS-E-2, Emergency Criticality Evacuation, Rev. 42
 NFS-HS-E-3, Emergency Response Organization, Rev. 28
 NFS-HS-E-4, Fire Reporting and Response, Rev. 37
 NFS-HS-E-5, Spill Response and Reporting, Rev. 34
 NFS-HS-E-6, Electrical Power Failure, Rev. 27
 NFS-HS-E-7, On-Site Radiological Emergency Assessment, Rev. 31
 NFS-HS-E-8, Off-Site Radiological Emergency Assessment, Rev. 26
 NFS-HS-E-9, Off-Site Dose Projection for Radiological Emergency, Rev. 27
 NFS-HS-E-10, Emergency Communications, Rev. 28
 NFS-HS-E-11, Radiological Scene and Contamination Control, Rev. 24
 NFS-HS-E-12, 24-Hour Emergency Response for Hazardous Material Transportation, Rev. 20
 NFS-HS-E-13, Emergency Take Cover, Rev. 7
 NFS-HS-E-14, CO2 Evacuation Alarm Response and Responsibilities, Rev. 12
 NFS-HS-E-15, Emergency Medical Response, Rev. 13
 NFS-OPS-1, Conduct of Operations, Rev. 6
 NFS-Q-202, Inspection and Analysis of Six-Inch Glass, Rev. 7
 NFS-TS-009, Configuration Management of Process Changes, Rev. 6
 NFS-WM-1-1, NFS Work Management Program Description, Rev. 1
 NFS-WM-1-2, NFS Work Control Process, Rev. 2
 NFS-WM-1-3, NFS Work Execution Process, Rev. 1
 NFS-WM-1-4, NFS Work Acceptance & Closure Process, Rev. 1
 SOP 401-8, Area 800, Rev. 23
 SOP 401-2-302, Building 302 – Area 200
 SOP 401-41, Area LA – Building 304

Records:

21T-15-2579, 21T-15-2586, 21T-15-2587, 21T-15-2640, 21T-15-2648, 21T-15-2649, 21T-15-2775
 21T-15-1145, Initial Emergency Control Director (ECD) Qualification for Richard Freudenberger, dated April 23, 2015
 21T-15-2246, NFS Annual Criticality Alarm Evacuation Drills memo (prep schedule), dated September 3, 2015
 23T-98-2011, Inspection Data Sheet, Identification 6100-60120-001/002, dated May 1998

54T-09-0064, Nuclear Criticality Safety Evaluation for the Blended Low Enriched Uranium Preparation Facility Solvent Extraction (U), Rev. 11
 54T-15-0004, Nuclear Criticality Safety Evaluation for 300 Complex Waste Handling, Rev. 1
 54X-15-0005, Control Flowdown and Field Verification for Area 800, Rev. 10
 54X-13-0004, Nuclear Criticality Safety Evaluation for Area 800 of the Production Fuel Facility, Rev. 10
 71T-15-0377, Small Team Tap Root Investigation for PIRCS 12001 Unit K Event, dated December 3, 2015
 ALARA Goals for January 1, 2016 through December 31, 2016, dated March 1, 2016
 Annual Criticality Drill, 1st shift September 30, 2015
 Annual Criticality Drill, 2nd shift September 25, 2015
 Annual Criticality Drill, 3rd shift September 27, 2015
 Annual Criticality Drill, BLEU Complex, September 29, 2015
 BLEU-HS-B-40 Attachment B, Radiological Survey Equipment (Bldg. 540)-dated January 29, 2016
 BLEU-HS-B-40 Attachment B, Radiological Survey Equipment (Bldg. 540)-dated February 2, 2016
 Calibration Check Failure Evaluation, N333XXXXTE2P18A, 333-HEATER-2P18, 333-HEATER-2P19, 333-TE-2P18A, 333-TSH-2P18A.
 CARB Agendas dated February 22 and March 14, 2016
 CCP-20160101
 Conduct of Operations Level 2 Package for Building 307 Configuration Management Issues ECR-20150185 including LOA 2266W-003, Receipt Calciner Performance Qualification for Clean Filter Media Processing
 ECR 20160256
 Filename 951CHK2.D, Boron Isotope Ratio Report
 Filename CHKSTD2, Boron Sample Test Report, dated May 16, 2011
 Fire Protection Training Schedule, e-mail dated February 19, 2016
 Fire System Impairment 2016-034, Door 344 Not Latching
 Internally Authorized Change (IAC) 886, Building 302 Production Area Roof Replacement
 IAC 887, Building 302 Equipment Protection
 IROFS 000-FACILITYSUPPORT, for N000XCRTDETSYS, completed January 14, 2016
 IROFS 000-FACILITYSUPPORT, for N000XCRTDETSYS, completed September 25, 2015
 IROFS 000-FACILITYSUPPORT, for N000XCRTDETSYS, completed July 28, 2015
 LA Mass Log Runsheet 41A, dated February, 20, 2016
 Letter of Agreement – Radiation Emergency assistance Center/Training Site (REAC/TS) Support, dated October 19, 2015
 Letter of Agreement between the Erwin Fire Department and Nuclear Fuel services, Inc. (NFS), dated August 12, 2014
 Letter of Agreement between the South Unicoi County Volunteer Fire Department and Nuclear Fuel Services, Inc. (NFS), dated September 10, 2014
 Letter of Agreement between MedicOne Response and Nuclear Fuel services, Inc. (NFS), dated August 11, 2014
 Letter of Agreement between Unicoi County Memorial Hospital and Nuclear Fuel Services, Inc. (NFS), dated November 19, 2013
 Letter of Agreement between Johnson City Medical Center Hospital (JCMCH) and Nuclear Fuel services, Inc. (NFS), September 15, 2014
 Letter of Agreement between the Town of Erwin and Nuclear Fuel Services, Inc. (NFS), dated November 19, 2013
 Natural Gas Leak Line Repair Sequence of Events and Control/Isolation Scheme
 NFS Emergency Personnel Call List, Rev. 37

NCS Engineer Qualifications for Michael Eakin, Samuel Skiles, and Blaine Rice
 NFS-HS-A-05-B, Modes of Alarm Activation Test Checklist, Rev. 1, completed
 January 14, 2016
 NFS-HS-B-40 Attachment E, Emergency Monitoring Supply Center (EMSC) Checklist, Rev.
 26, completed January 4, 2016 (equipment inspection and inventory)
 NFS-HS-B-40 Attachment A, Emergency Shelter (Building 350), Rev. 26, completed
 January 7 and 12, 2016 (equipment inspection and inventory)
 NFS-HS-B-40 Attachment C, Emergency Control Center (Building 320), Rev. 26, completed
 January 6, 2016 (equipment inspection and inventory)
 NFS-HS-B-40 Attachment D, Emergency Response Vehicle Equipment Checklist, Rev. 26,
 completed January 7, 2016 (equipment inspection and inventory)
 NFS Laboratory Analysis Report for Boron, dated May 16, 2011
 NFS Offsite Agency Orientation and Training attendance Roster, dated December 10, 2015
 (includes Unicoi EMA, Southside VFD, JCFD, TN Dept of Health, Medicone EMS, EFD,
 TEMA, Wings, North East Regional Health Office
 NFS Offsite Agency Orientation and Training Unicoi Memorial Hospital attendance Roster,
 dated January 13, 2016 (includes Unicoi County Medical Center, NFS RNs)
 NFS Offsite Agency Orientation and Training sign-in sheet dated December 9, 2015
 (includes MSHA, JCMC)
 NFS Quarterly Assessment of Offsite Ambient Radiation 3rd Quarter 2015, November 12,
 2015
 Off Site Agency Call List quarterly check completed December 17, 2015, September 29,
 2015, March 27, 2015, and June 24, 2015
 Offsite Agency Orientation and Training Material/Lesson Plan, dated December 10, 2015
 Offsite Responders Criticality Safety Emergency Response Training/Lesson Plan, dated
 December 10, 2015
 PQ Test Plan 55T-15-0035, Rev. 0, 301 Receipt Calciner Performance Qualification for
 Clean Filter Media Processing
 QA-15-21, Emergency Preparedness Quality Assurance Audit, dated December 18, 2015
 Radiation Protection for Emergency Response Lesson Plan
 SA-ERO-ART, Lesson Plan for Emergency Response Organization (ERO) Annual Training
 SA-FRDAMP-INSP, Fire Damper Inspection and Testing Training
 Safety Emergency Response Organization Annual Refresher Training records as of
 February 1, 2016 (60 qualified individuals)
 September Toolbox – Criticality Evacuation Emergency Procedure Review
 Set Point Evaluation for Area 800, Inline Filter, N307xFILTERx811 & 812.
 Simple Triage and Rapid Treatment (START) training module
 Survey 83624
 Test Plan, B307 Unit K System Interlocks Operational Qualification, TP-JA0401-001-06,
 Rev. 0 as follows:
 Test Sequence 307-TSH-K807A Interlock SCR A, dated December 31, 2015
 Test Sequence 307-TSH-K807A Interlock SCR B, dated December 31, 2015
 Test Sequence 307-IS-K807A Interlock, dated December 31, 2015
 Test Sequence 307-IS-K809 FRNCOV K801 GFCI [1st], dated December 31, 2015
 Test Sequence 307-IS-K811 FRNCOV, K801 GFCI [2nd], dated December 31, 2015
 Test Sequence 307-IS-K812 FRNCOV, K803 GFCI, dated December 31, 2015
 Test Sequence 307-IS-K814 HEATER K801 GFCI, dated December 31, 2015
 Test Sequence 307-IS-K815 HEATER K802, dated December 31, 2015
 Test Sequence 307-FQIT-K001, FRE-41 Argon, Interlock, dated January 6, 2016
 Work Request (WR) 230150, WR 228272, WR 228898, WR 240260, WR 243061, WR
 243092, WR 243093

WR 243694 – Perform Source Test of Crit Detector pair 330/WWTF to insure Crit Detection System is Operable, dated November 28, 2015
WR 243878, 302 TIC-0G01, SRE N302xxAREAGHTRS.
WR 244669, Install Sealed Penetration Cover
WR 245075, Reposition Enclosure 0804 Door Gasket

PIRCS Reviewed:

47000, 47292, 47339, 47659, 47686, 47907, 47912, 47919, 47972, 48069, 48353, 48368, 48370, 48541, 48559, 48772, 48774, 48789, 48799, 48831, 49163, 49449, 49471, 49477, 49651, 49727, 49812, 50025, 50149, 50150, 50151, 50159, 50160, 50242, 50315, 50504, 50527, 50528, 50562, 50580, 50736, 50737, 50740, 50741, 50742, 50745, 50751, 50753, 50756, 50758, 50761, 50768, 50769, 50770, 50771, 50943, 50944, 51183, 51184, 51186, 51187, 51376, 51407, 51555, 51559, 51570, 51572, 51592, 51593, 51641, 51680, 51681, 51682, 51695, 51698, 51721, 51723, 51755, 51781, 51813, 51898, 51902, 51940, 51975, 51993, 52005, 52006, 52014, 52027, 52030, 52051, 52057, 52086, 52278, 52281, 52328, 52329, 52330, 52392, 52404, 52406, 52418