



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
REGION II
245 PEACHTREE CENTER AVENUE N.E., SUITE 1200
ATLANTA, GEORGIA 30303-1200

October 27, 2020

Mr. John A. Stewart
President
Nuclear Fuel Services, Inc.
P.O. Box 337, MS 123
Erwin, TN 37650-0337

**SUBJECT: NUCLEAR FUEL SERVICES, INC. – U. S. NUCLEAR REGULATORY
COMMISSION INTEGRATED INSPECTION REPORT NUMBER 70-143/2020-003
AND NOTICE OF VIOLATION**

Dear Mr. Stewart:

This letter refers to the inspections conducted from July 1, 2020, through September 30, 2020, at the Nuclear Fuel Services (NFS) facility in Erwin, Tennessee. During that period, the U. S. Nuclear Regulatory Commission (NRC) implemented alternative ways to complete the core inspection program for your facility when routine onsite inspections could not be performed due to the public health emergency declared by the Secretary of Health and Human Services on January 31, 2020 (as renewed on April 21, 2020, and July 23, 2020), and the National Emergency declared by the President of the United States on March 13, 2020, concerning the novel coronavirus disease (COVID-19).

The enclosed report presents the results of the inspections, which were conducted through a combination of remote reviews and onsite observations. The inspectors reviewed activities as they relate to public health and safety, the common defense and security, and compliance with the Commission's rules and regulations, as well as the conditions of your license. The inspections covered the areas of safety operations, radiological controls, facility support, and other areas.

Within these areas, the inspectors reviewed procedures and representative records remotely and conducted telephonic interviews with site personnel. In some instances, regional inspectors were able to conduct routine inspections onsite as originally planned. The resident inspector also visited the facility two or more times per week to monitor plant conditions and conduct focused inspection activities. The findings were discussed with you and members of your staff at exit meetings held on August 20, 2020; August 27, 2020; September 17, 2020; and October 20, 2020.

Based on the results of the inspections, the NRC has determined that a Severity Level IV violation of NRC requirements occurred. This violation was evaluated in accordance with the NRC Enforcement Policy. The current Enforcement Policy is included on the NRC's Web site at <https://www.nrc.gov/about-nrc/regulatory/enforcement/enforce-pol.html>. The violation is cited in the enclosed Notice of Violation (Notice), and the circumstances surrounding that violation are described in detail in the subject inspection report. The violation is being cited in the Notice because it is considered self-revealing and not identified by the licensee.

The NRC has concluded that information regarding: (1) the reason for the violation(s); (2) the corrective actions that have been taken and the results achieved; and (3) the date when full compliance was achieved is already adequately addressed on the docket in the enclosed NRC inspection report. Therefore, you are not required to respond to this letter unless the description herein does not accurately reflect your corrective actions or your position. In that case, or if you choose to provide additional information, you should follow the instructions specified in the enclosed Notice.

The NRC has also determined that another Severity Level IV violation of NRC requirement occurred. Because NFS identified and corrected the violation, and because the violation was not repetitive or willful this violation is being treated as a Non-Cited Violation (NCV), consistent with Section 2.3.2 of the Enforcement Policy. This NCV is described in the subject inspection report. If you contest the violation or significance of the NCV, 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) Mr. Larry Harris, NRC Resident Inspector at NFS.

Additionally, the inspectors implemented measures during the inspection period to support the determination of reasonable assurance that the public and the environment will be adequately protected from the hazards related to the operation of your facility. These compensatory measures included activities such as supplemental reviews of licensee-submitted reports (e.g. effluent reports, plant modification reports, and changes to the Integrated Safety Analysis Summary) and increased communications with your staff to discuss the status of plant operations.

The compensatory measures did not constitute direct inspection and were intended to address the impact of the COVID-19 public health emergency on the agency's routine oversight program, particularly on the continuous engagement with your facility via periodic site visits and in-person interactions. These proactive actions were taken to obtain additional insights into the safe operation of the facility during the COVID-19 public health emergency.

The NRC will continue evaluating the guidelines and recommendations from federal and state authorities, along with the conditions of your facility, to determine how to best conduct inspections until normality can be achieved. In the interim, the NRC plans to conduct periodic resident inspector visits to the site and gradually increase their presence, as appropriate. The NRC will also maintain compensatory measures and frequent communications with your staff to discuss regulatory compliance matters and gather information to inform the decisions about future inspections.

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 enclosure 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>. To the extent possible, your response should not include any personal privacy or proprietary, information so that it can be made available to the Public without redaction.

Should you have any questions concerning these inspections, please contact Joel Rivera-Ortiz, Senior Project Inspector of my staff at 404-997-4825.

Sincerely,

/RA/

Robert E. Williams Jr., Chief
Projects Branch 1
Division of Fuel Facility Inspection

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

Enclosures:

1. Notice of Violation
2. NRC Inspection Report 70-143/2020-003
w/Attachment: Supplemental Information

cc: (See Page 4) Distribution via LISTSERV®

SUBJECT: NUCLEAR FUEL SERVICES, INC. – U. S. NUCLEAR REGULATORY
 COMMISSION INTEGRATED INSPECTION REPORT NUMBER 70-143/2020-
 003 AND NOTICE OF VIOLATION dated October 27, 2020

DISTRIBUTION:

D. Marcano, NMSS
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PUBLICLY AVAILABLE NON-PUBLICLY AVAILABLE SENSITIVE NON-SENSITIVE
 ACCESSION NUMBER: **ML20301A802** SUNSI REVIEW COMPLETE FORM 665 ATTACHED

OFFICE	RII:DFFI/PB1	RII:DFFI/PB1	RII: DFFI/PB1	RII:DFFI/PB1	RII:DFFI/PB2	RII:DFFI/PB2	RII:DFFI/PB2	RII:DFFI/PB1
NAME	L. Harris	J. Rivera-Ortiz	L. Cooke	N. Peterka	L. Pitts	T. Sippel	T. Vukovinsky	R. Williams
DATE	10/08/2020	10/15/2020	10/15/2020	10/16/2020	10/22/2020	10/15/2020	10/22/2020	10/27/2020
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NOTICE OF VIOLATION

Nuclear Fuel Services, Inc.
Erwin, Tennessee

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

During Nuclear Regulatory Commission (NRC) inspections conducted from July 1, 2020 to September 30, 2020, a violation of NRC requirements was identified. In accordance with the NRC Enforcement Policy, the violation is described below:

License Condition S-1 states, in part, that the license is for “use in accordance with the statements, representations and conditions in the application.”

Chapter 11, Section 11.4, “Procedure Development and Implementation,” of the license application states, in part, “Activities involving the handling of special nuclear material (SNM) and/or items relied on for safety (IROFS) are conducted in accordance with written procedures as defined in this section.” Additionally, Section 11.4.1, “Operating Procedures,” of the license application states, in part, “Operating procedures are documents written to authorize a) the processing of radioactive material or b) a decommissioning activity; and, within these documents detailed instructions for operation of equipment used in the process or activity, instructions for the disposition of radioactive wastes, and limits and controls established for safety purposes, including IROFS, are identified.”

Contrary to the above, on August 31, 2020, the licensee failed to handle SNM in accordance with approved procedure SOP-401-02-302, Revision 051E in Building 302, Area 200. Specifically, an operator failed to follow written instructions in the subject operating procedure which resulted in a spill of SNM from a material storage vessel, an unplanned contamination in a process area, and accidental worker exposure to licensed material.

This is a Severity Level IV violation. (Section 6.2.d.2)

The NRC has concluded that information regarding the reason for the violation, the corrective actions taken and planned to correct the violation, and the date when full compliance was restored, is already adequately addressed in the enclosed NRC inspection report 70-143/2020-003. 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 chose 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, D.C 20555-001 with a copy to the Regional Administrator, Region II, within 30 days of the date of the letter transmitting this Notice of Violation (Notice).

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 (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, classified, 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 27th day of October 2020

U. S. NUCLEAR REGULATORY COMMISSION

REGION II

INSPECTION REPORT

Docket No.: 70-143

License No.: SNM-124

Report No.: 70-143/2020-003

Enterprise Identifier: I-2020-003-0066

Licensee: Nuclear Fuel Services, Inc.

Facility: Nuclear Fuel Services, Inc.

Location: Erwin, TN 37650

Dates: July 1 through September 30, 2020

Inspectors: L. Harris, Senior Resident Inspector (Sections: A.1, A.2, A.3, A.5, B.1, C.1, C.2, C-3, C.4, D.1)
J. Rivera-Ortiz, Senior Fuel Facility Inspector (Section A.1, C.5)
L. Cooke, Fuel Facility Inspector (Section B.2 - B.4)
N. Peterka, Fuel Facility Inspector (Section A.4)
L. Pitts, Senior Fuel Facility Inspector (Section C.5)
T. Sippel, Fuel Facility Inspector (Section A.4)
T. Vukovinsky, Senior Fuel Facility Inspector (Section C.5)

Approved by: R. Williams, Chief
Projects Branch 1
Division of Fuel Facility Inspection

EXECUTIVE SUMMARY

Nuclear Fuel Services, Inc.
U.S. NRC Integrated Inspection Report 70-143/2020-003
July 1 – September 30, 2020

Resident and regional inspectors from the U.S. Nuclear Regulatory Commission (NRC), Region II Office, conducted inspections at the Nuclear Fuel Services (NFS) facility during normal and off-normal hours in the areas of safety operations, radiological controls, facility support, as well as other areas. Due to the coronavirus (COVID-19) disease, the inspectors performed remote examinations of selected licensee activities in conjunction with focused observations of safety significant activities on site via walk-downs of the facility, interviews with licensee personnel, and review of facility records.

Safety Operations

- One Severity Level IV, cited violation of NRC requirements was identified in the area of operational safety, plant status activities. (Section A.1.b)
- No violations of more than minor significance were identified in the operational safety area. (Section A.2)
- No violations of more than minor significance were identified in the Nuclear Criticality Safety (NCS) area. (Sections A.3 and A.4)
- No violations of more than minor significance were identified related to the Fire Protection Program. (Section A.5)

Radiological Controls

- No violations of more than minor significance were identified related to the Radiation Protection (RP) area (Sections B.1 and B.2).
- No violations of more than minor significance were identified in the area of radioactive waste processing, handling, storage, and transportation. (Section B.3)
- No violations of more than a minor significance were identified in the area of effluent control and environmental protection. (Section B.4)

Facility Support

- No violations of more than minor significance were identified in the area of post-maintenance and surveillance testing. (Sections C.1 and C.2)
- No violations of more than minor significance were identified in the area of problem identification and resolution. (Section C.3)
- No violations of more than minor significance were identified during the observation of an emergency preparedness drill. (Section C.4)
- No violations of more than minor significance were identified in the triennial review of plant modifications. (Section C.

Other Areas

- One licensee-identified, Severity Level IV, Non-Cited Violation (NCV) was identified related to the failure to maintain an administrative item relied on for safety (IROFS) associated with temporary material placement. (Paragraph D.1)
- No violations of more than minor significance were identified during Resident Inspector observations of security force and material and control accounting personnel. (Paragraph D.2)

Attachment

Supplemental Information

REPORT DETAILS

Summary of Plant Status

The following facility process areas were operating during the inspection period: 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. Resident Inspection Program – Plant Status Activities (Inspection Procedures 88135 and 88135.02)

a. Inspection Scope

During the inspection period, the inspectors performed routine walk-downs of fuel manufacturing areas housing special nuclear material (SNM), including the FMF, BPF, commercial development line areas, miscellaneous storage areas, the Wastewater Treatment Facility (WWTF), and Building 440 to assess the operational status of those areas. Primarily, the inspectors performed the walk-downs to verify that safety controls, including IROFS, were in place, properly labeled, and functional to ensure proper control of SNM.

During the walk-downs, the inspectors observed operators to verify they were knowledgeable of their duties and attentive to any alarms or annunciators at their respective stations. The inspectors also observed the interactions between supervisors and operators within the operating areas to verify that their communications supported safe operation of licensed activities. The inspectors observed activities during normal and upset conditions to verify that operators complied with procedures and station material limits.

The inspectors performed periodic tours of the outlying facility areas to verify 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, as well as potential degradation of plant security features.

During these tours, the inspectors also observed that the required NRC Form 3, "Notice to Employees," was appropriately and conspicuously posted in accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) Part 19.11.

The inspectors interviewed plant staff assigned to different disciplines to discuss issues regarding plant equipment. Particularly, the inspectors interviewed operators, front-line managers, maintenance technicians, engineers, RP technicians, and nuclear materials control technicians to verify that each of the individuals met the applicable training and proficiency requirements in the license application for NCS posting requirements, hazards, and the operations procedures associated with their assigned duties.

The inspectors reviewed operator logbooks, standard operating procedures, maintenance records, and Letters of Authorization (i.e., temporary procedures) to obtain information concerning operating trends and activities.

The inspectors also reviewed the licensee's implementation of corrective actions for conditions requiring temporary modifications and compensatory measures to verify adherence to plant procedures. The inspectors also reviewed changes to procedures NFS-HS-E-02, Revision 48, "Nuclear Criticality Evacuation" and NFS-HS-E-15, Revision 19, "Emergency Medical Response" to confirm changes did not conflict with regulatory or license requirements.

The inspectors discussed the results of operational and shift turnover meetings throughout the inspection period with plant personnel to gain insight into safety and operational issues. The inspectors discussed items covered during plan-of-the-day meetings and interviewed the Plant Shift Superintendent staff daily to assess the overall status of the plant and the licensee's corrective actions to resolve safety-significant issues identified in these meetings.

b. Conclusion

One Severity Level IV violation of NRC requirements was identified in the area of operational safety, plant status activities. The violation is described below.

1) (CLOSED) Failure to Comply with Procedural Requirements for Operations in Area 200 (Notice of Violation 2020003-002)

Introduction: The inspectors identified a self-revealing, Severity Level IV, cited violation of License Condition S-1 for the licensee's failure to follow operating procedures as described in Chapter 11 of the license application.

Description: On August 31, 2020, a trained operator assigned to the third shift manually manipulated a part of a storage vessel in Building 302, Area 200 to address a particular process condition and enable the transfer of SNM to the next processing step. As a direct result of the manual manipulation, a portion of the storage vessel broke and SNM contained in the vessel spilled on the process floor. When the storage vessel broke, part of the SNM spilled onto the lower extremities of the operator resulting in personnel contamination. Additionally, other licensee personnel were contaminated during the subsequent clean-up activities after being exposed to part of the contents of the storage vessel. The activities assigned to the operator were governed by Standard Operating Procedure (SOP)-401-02-302, Revision 051E. The manual manipulation of the storage vessel part was not the method identified in SOP-401-02-302 to address the process condition observed by the operator.

Analysis: The inspectors determined the operator manipulation of the storage vessel in Building 302, Area 200 was not authorized by SOP-401-02-302 and constituted a violation of License Condition S-1 for not handling SNM in accordance with written procedures as defined in Section 11.4 of the license application. The inspectors determined the violation was more-than-minor based on the screening criteria of IMC 0616, "Fuel Cycle Safety and Safeguards Inspection Reports," Appendix B, "Examples of Minor Violations." The inspectors determined the violation could reasonably be considered a precursor to a significant event per Question 1 of the screening process because it was similar to Example 1.a in that the failure to follow procedure resulted in an unsafe configuration of SNM that adversely impacted nuclear or radiological safety of equipment and personnel.

Specifically, the failure to follow procedure adversely impacted the containment of SNM, which is credited for the safe operation of the process, caused an unplanned contamination in the process area, and exposed a worker to licensed material. This event did not result in serious safety consequences because: (1) the spill was contained within the Material Access Area (MAA), where physical access is controlled and radiologically control area (RCA) measures, including contamination boundaries, are normally maintained, (2) the IROFS credited for an SNM spill accident in that process area performed as designed and the performance requirements of 10 CFR 70.61 were still met based on the approved Integrated Safety Analysis (ISA) methodology for the facility, (3) the amount of licensed material spilled was below the analyzed quantities in the ISA, (4) there was no release of licensed material to the environment, (5) the RCA air sample monitors did not detect activity requiring further action, and (6) the post-event contamination of employees did not result in employee injuries or radiological/chemical exposure beyond NRC regulatory limits.

The inspectors determined that the violation was of Severity Level IV significance because the violation aligned with Example 6.2.d.2 of the Enforcement Policy in that it involved the licensee's failure to maintain a control required to meet a safety margin where the failure did not result in a Severity Level I, II, or III violation. Additionally, in accordance with Section 2.2.2 of 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 consequences are characterized as Severity Level IV violations.

Enforcement: License Condition S-1 states, in part, that the license is for "use in accordance with the statements, representations and conditions in the application." Chapter 11, Section 11.4, "Procedure Development and Implementation," of the license application states, in part, "Activities involving the handling of SNM and/or IROFS are conducted in accordance with written procedures as defined in this section." Additionally, Section 11.4.1, "Operating Procedures," of the license application states, in part, "Operating procedures are documents written to authorize a) the processing of radioactive material or b) a decommissioning activity; and, within these documents detailed instructions for operation of equipment used in the process or activity, instructions for the disposition of radioactive wastes, and limits and controls established for safety purposes, including IROFS, are identified."

Contrary to the above, on August 31, 2020, the licensee failed to handle SNM in accordance with approved procedure SOP-401-02-302, Revision 051E in Building 302, Area 200. Specifically, an operator assigned failed to follow written instructions in the subject operating procedure which resulted in a spill of SNM from a material storage vessel, an unplanned contamination in a process area, and accidental worker exposure to licensed material. This violation is being treated as a cited violation consistent with Section 2.3.2 of the Enforcement Policy because it was identified through an event (i.e. self-revealing) and not by the licensee.

The licensee took prompt corrective actions to restore compliance for this event which included: (1) evaluation of reportability to the NRC in accordance with Amendment 13 of Materials License SNM-124 (ADAMS ML20190A214), (2) increase in management oversight of the event to oversee decontamination efforts and return to operations, (3) shutdown of the affected process areas, (4) establishing additional RCA boundaries, additional personal protective equipment requirements, and radiological monitoring to further control the contamination, (5) successful decontamination of affected staff and process area, and (6) implementation of credited criticality safety controls to collect the

spilled SNM in safe containers. Additionally, the remaining material in the system was processed under temporary operating procedures to allow repairs and modifications of the processing equipment to reduce the likelihood of occurrence and restore licensed material containment. The process was returned to normal operation after the modifications. The licensee entered the violation in its Problem Identification, Resolution, and Correction System (PIRCS) as item number 80393 for formal investigation and resolution.

This is a violation of the requirements of License Condition S-1. A Notice of Violation is attached, and the violation will be tracked as VIO 70-143/2020003-02, "Failure to Comply with Procedural Requirements for Operations in Area 200."

2. Resident Inspection Program – Operational Safety (Inspection Procedure 88135.04)

a. Inspection Scope

The inspectors reviewed procedures, drawings, related sections of the ISA Summary, and the license application to identify design attributes, safety functions, tests, and inspections applicable to selected safety-significant systems involved with the processing of SNM. The safety systems selected for review were associated with the ventilation system for Building 300 complex, Building 105 Laboratory, Building 301, and Building 333. The inspectors performed walk-downs of the systems to verify, in part, that system alignment and as-built configurations matched approved plant drawings and that IROFS assumptions and controls were properly implemented in the field. The inspectors also 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 reviewed ISAs for the selected plant systems to verify that their safety functions were not affected by outstanding design issues, temporary modifications, operator workarounds, adverse conditions, or other system-related issues. The inspectors reviewed plant conditions in the selected process areas to verify that the performance and operability of IROFS, safety-related devices, or other support systems essential to safety system performance were not degraded.

During the walk-downs, the inspectors considered the following attributes on a sampling basis and as applicable to the selected systems:

- controls in place for potential criticality, chemical, radiological, and fire safety hazards
- process vessel configurations maintained in accordance with nuclear criticality safety evaluations (NCSEs)
- 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
- functional lockout/tag-put program appropriately implemented
- cabinets, cable trays, and conduits correctly installed and functional
- visible cabling in good material condition
- no interference with system performance from ancillary equipment or debris.

The inspectors reviewed the IROFS listed below to verify their implementation in accordance with the applicable requirements in the license application and 10 CFR 70. The IROFS reviewed for the ventilation system associated with the Building 300 Complex, Building 105 Laboratory, Building 301, and Building 333:

- N304VENDRAIN034
- N302AIRGAP0A06
- N304XFILTERVL03
- N105FILTERVE52
- N301XVDRAIN9M01
- N333XFILTER6G21

b. Conclusion

No violations of more than minor significance were identified.

3. Resident Inspection Program – Nuclear Criticality Safety (Inspection Procedure 88135.02)

a. Inspection Scope

The inspectors performed weekly production area walk-downs to verify that 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 several criticality related IROFS for operability and interviewed operators to verify that they were knowledgeable of the requirements associated with the IROFS. During walkdowns, the inspectors observed SNM movements taking place within the facility to verify that criticality safety controls were followed.

As part of routine day-to-day activities, the inspectors reviewed entries in the licensee's PIRCS associated with criticality safety aspects. The inspectors reviewed the licensee's response to such entries and held discussions with NCS engineers and production personnel to understand their safety significance and verify compliance with site procedures.

The PIRCS records reviewed included 79872, 80388, and 80453.

b. Conclusion

No violations of more than minor significance were identified.

4. Nuclear Criticality Safety (Inspection Procedure 88015, Onsite Inspection with Remote Support)

a. Inspection Scope

Criticality Analysis (Onsite Inspection)

The inspectors evaluated selected aspects of the licensee's Nuclear Criticality Safety Program to verify compliance with selected portions of 10 CFR 70, including 70.61(d), Chapter 5 of the facility's license application, and applicable licensee procedures.

The inspectors reviewed selected NCSEs and associated calculations to verify that they were consistent with the commitments in the license application. These commitments included the double contingency principle, assurance of subcriticality under normal and credible abnormal conditions with the use of subcritical margin, and technical practices and methodologies outlined in Section 5.5.2 of the license application for mass, material composition, reflection and interaction between fissile material. The inspectors focused their review on NCSEs that had not recently been reviewed in an NCS inspection. The NCSEs reviewed included 54T-13-0019, "Nuclear Criticality Safety Evaluation for the Dissolution of Uranium and High Enriched Uranium Storage Columns," Revision 20; 54T-17-0006, "Nuclear Criticality Safety Evaluation for the 301 Receipt Calciner Furnace," Revision 7; and those listed in Section 4 of the attachment to this report.

The inspectors reviewed the licensee's generation of accident sequences to determine whether the NCSEs systematically identified normal and credible abnormal conditions in accordance with the commitments and methodologies in the license application for the analysis of process upsets. The inspectors reviewed assumptions made for upset conditions to verify they were clearly described, appropriately conservative, and matched the calculation input files. The inspectors also reviewed the protection scores assigned to IROFS in the NCSEs to determine whether they were consistent with the license application and resulted in the scenario being highly unlikely. This review was conducted for the BPF Receipt Calciner and Uranium Dissolution systems.

The inspectors interviewed licensee staff to verify that no changes were made to the validation report since the last NCS inspection.

Criticality Implementation (Onsite Inspection)

The inspectors performed walk-downs and observed operations in BPF to determine whether existing plant configuration and operations were covered by, and consistent with, the process description and safety basis in the selected NCSEs listed above. The inspectors reviewed process and system descriptions, the NCSEs, and interviewed licensee NCS engineers to verify that engineered controls established in the NCSEs were included and being implemented as specified. The engineered controls reviewed included, mass controls, (e.g., CRF-9), moderator controls (e.g., CRF-12), and geometry controls (e.g., BUM-45). The inspectors reviewed operating procedures (i.e., SOP-409, Section 8) and postings (e.g., CL-26-02) to verify that selected administrative controls established in the NCSEs were included. The administrative controls reviewed included, mass controls (e.g., BUM-29), geometry control (e.g., BPF-1, BPF-2), and piece count (e.g., CRF-2).

The inspectors reviewed the ISA Summary and supporting ISA documentation to determine whether the controls identified in the ISA were supported by technical bases in the NCSEs. These included selected controls, including those listed above for walk-downs, that were applied to the BPF Receipt Calciner and Uranium Dissolution systems.

Criticality Operational Oversight (Remote Inspection)

The inspectors reviewed NCS-related training material remotely to determine whether operator training included instruction in criticality hazards and control methods, and whether the licensee's established NCS-related operator training was consistent with commitments in Section 5.3.2 of the license application, including applicable American Nuclear Society standards.

Additionally, the inspectors interviewed licensee NCS staff by telephone to determine whether the NCS function was involved in the development of operator training, as required. The NCS-related training records reviewed included "NCS Familiarization PowerPoint for Operators."

The inspectors reviewed records of NCS audits remotely to determine whether NCS staff routinely assessed field compliance with established NCS controls. Additionally, the inspectors interviewed NCS management by telephone and reviewed procedures and schedules to verify that NCS audits of processing or storage areas of SNM were audited biennially as required by Section 5.3.4 of the license application. The records of NCS audits reviewed included the Building 105 Laboratory 6-inch Rocket NCSE audit.

Criticality Incident Response and Corrective Action (Remote Inspection)

The inspectors reviewed selected PIRCS entries remotely to verify that anomalous NCS conditions were promptly identified and entered into the PIRCS, that they received the required level of investigation, and that they were closed out consistent with license commitments and procedures. The inspectors reviewed the associated corrective actions to verify they were consistent with program procedures and appropriate to correct the condition, if preventing recurrence was not required. Additionally, the inspectors reviewed the selected PIRCS entries to assess whether the licensee followed regulatory requirements and procedures regarding plant conditions to the NRC. The entries reviewed included PIRCS 79472 and its associated investigation report. Additional PIRCS entries reviewed are listed in the Supplementary Information section of this inspection report.

b. Conclusion

No violations of more than minor significance were identified.

5. Resident Inspection Program – Fire Protection (Inspection Procedure 88135.05, Quarterly Review)

a. Inspection Scope

During routine plant tours, the inspectors reviewed licensee controls for transient combustibles in selected process areas to verify compliance with the Fire Protection Program as described in Chapter 7 of the license application. The inspectors reviewed active fire impairments in selected process areas to determine if they were implemented per site procedures.

The inspectors conducted a walk-down of areas in the Building 105 Laboratory, reviewed scheduled surveillances, and pre-fire plan drawings to verify it matched the as-found condition of various fire protection components like extinguishers and postings. The inspectors also reviewed routine audits of areas in Buildings 306 and 311.

The inspectors reviewed routinely scheduled fire safety related inspections to assure they were conducted, and that any identified deficiencies were addressed.

The inspections reviewed included:

- monthly safety lights inspection, Building 306 and 311
- annual sprinkler inspection, Building 105 Laboratory
- monthly control of combustibles inspection, Building 306
- fire damper inspection, Building 105 Laboratory and Building 311
- semiannual testing of CO₂ fire suppression systems
- fire alarm manual pull station tests

The inspectors reviewed surveillance tests for the CO₂ fire suppression system in Buildings 302 and 303 to determine if the tests were performed at the required frequency and that any deficiencies were addressed. The following tests were reviewed: N302XXCO2SYSTEM and 303XXCO2SYSTEM.

The inspectors reviewed the material condition of fire protection components to verify they were adequately maintained. The inspectors reviewed a sample of fire related PIRCS entries to verify that corrective actions were identified and implemented in accordance with the license application and licensee procedures.

The PIRCS records reviewed included 79962, 80074, and 80356.

b. Conclusion

No violations of more than minor significance were identified.

B. Radiological Controls

1. Resident Inspection Program – Radiation Protection (Inspection Procedure 88135.02, Quarterly Review)

a. Inspection Scope

During tours of the production areas, the inspectors observed RP 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 observed plant workers to verify they properly wore dosimetry and used protective clothing in accordance with applicable Special Work Permits (SWPs). The inspectors also reviewed radiation area postings to verify compliance with plant procedures and that they included radiation maps with up-to-date radiation levels. The inspectors reviewed a sample of RP instruments to verify their operation and calibration dates were consistent with plant procedures.

The inspectors performed a review of selected SWPs in effect during the inspection period in different operational areas and conducted a focused review for SWP-17661, “RMA 302-1/2” and the associated posted radiologically controlled area(s), to verify that the SWP contained the information required by the licensee’s procedures.

b. Conclusion

No violations of more than minor significance were identified.

2. Radiation Protection (Inspection Procedure 88030, Onsite Inspection)

a. Inspection Scope

The inspectors evaluated selected aspects of the licensee's RP program as part of an onsite inspection to verify compliance with selected portions of 10 CFR 20, the license application, and applicable procedures.

The inspectors reviewed selected SWPs and observed work being performed under those SWPs to verify that personnel complied with the requirements of the SWPs and Chapter 4 of the license application. Specifically, the inspectors focused on activities being performed under SWPs 20-09-020, 17661, and 17662. The inspectors verified that the SWPs were implemented in accordance with procedure NFS-GH-03, "Safety Work Permits" and that licensee staff understood and appropriately implemented the radiological controls specified in the SWPs.

The inspectors reviewed personnel decontamination records of plant workers to verify that they were decontaminated in accordance with NFS-HS-B-30, "Performing Personnel Decontamination" and 10 CFR 20. The inspectors reviewed personnel monitoring employee contamination reports in response to PIRC 80394, 80396, 80397, 80408, and 80409. The inspectors verified that dose appropriate follow-up actions were taken in accordance with NFS-HS-A-01, "Plant Action Limits and Investigation for Bioassay Measurements." The inspectors also reviewed nasal surveys, saliva surveys, and bioassay records to verify that employee dose results did not exceed applicable limits.

The inspectors observed radiation and contamination surveys to verify compliance with NFS-HS-B-80, "Contamination Surveys," and the requirements of 10 CFR 20.1501(a) and (b). The inspectors also reviewed contamination survey records to verify that results exceeding licensee action levels were decontaminated and verified to be below action levels.

The inspectors reviewed recent calibration records for instruments detecting alpha, beta, and gamma radiation to verify that the licensee maintained such equipment as per Chapter 4 of the license application. The inspectors also observed that the licensee had a notification system for when an instrument was due for calibration per 10 CFR 20.1501(c). The inspectors observed personnel monitoring stations such as hand-and-foot monitors and whole-body counters and continuous air samplers to verify these devices were within calibration.

The inspectors toured highly enriched uranium (HEU) and low enriched uranium (LEU) processing areas to verify that the licensee posted the areas in accordance with 10 CFR 20.1902 and 20.1903 and that radiological signs and postings accurately reflected radiological conditions within the posted area.

b. Conclusion

No violations of more than minor significance were identified.

3. Radioactive Waste Processing, Handling, Storage, and Transportation (Inspection Procedure 88035, Onsite Inspection)

a. Inspection Scope

The inspectors reviewed the licensee's handling of radioactive waste to evaluate whether the licensee had established, maintained, and implemented procedures in accordance with license requirements, quality assurance programs, and the requirements of 10 CFR Part 20 and 10 CFR Part 61, as applicable to low-level radioactive waste form, classification, stabilization, and shipment tracking.

The inspectors performed walk-downs of selected radioactive material storage areas to verify that the waste packages were in adequate physical condition and the containers were properly labelled to reflect their contents. The inspectors reviewed records of select waste packages to verify that the packages had the appropriate receipt inspections, container inspections, and certificates of compliance.

The inspectors reviewed the licensee's program for classifying low-level radioactive waste and mixed waste to verify compliance with 10 CFR 61.55 and 10 CFR 20 Appendix G. Specifically, the inspectors reviewed the procedures for classifying waste and observed waste being sorted, scanned, and classified. The inspectors also observed waste being packaged to verify that the waste form met the requirements of 10 CFR 61.56 and 10 CFR 20 Appendix G.

The inspectors reviewed the licensee's procedures for labeling and tracking waste shipments and observed a shipment being prepared for transit to verify that the shipment was prepared and documented in accordance with licensee procedures.

The inspectors reviewed the licensee's response to a leaking waste drum being stored in a shipping container to verify that leak was contained within the shipping container's walls and cleaned up. The inspectors also observed drums being repacked into Supersacks for additional containment. The inspectors reviewed the apparent cause evaluation and reviewed specific work instructions to verify that planned correctives actions for containing and disposing of the waste packages were consistent with plant procedures.

b. Conclusion

No violations of more than minor significance were identified.

4. Effluent Control and Environmental Protection (Inspection Procedure 88045, Onsite Inspection)

a. Inspection Scope

The inspectors evaluated whether the licensee had established and maintained an environmental protection program in accordance with Chapter 9, Environmental Protection and Chapter 11, Management Measures of the license application. The inspectors reviewed the environmental protection program to verify that the program was being implemented in accordance with the license and regulations.

The inspectors conducted a walk-down of ventilation stacks and ambient air stations and observed environmental radiation technicians collecting samples from both systems to verify that effluent equipment and systems were operable and maintained in accordance with the requirements of NFS-HS-B 18, "Collection and Analysis of NFS Stack Samples," and NFS-HS-B-20, "Routine Sampling of Environmental Media." The inspectors observed sample acquisition, preparation, counting, labelling, and chain of custody performed by the environmental lab to verify that the sampling was completed in accordance with NFS-HS-B-20.

The inspectors also conducted a walk-down of the wastewater treatment process and sanitary sewerage waste stream and observed the collection points for offsite soil and vegetation to verify that material was disposed of in accordance with 10 CFR 20.2003.

The inspectors reviewed routine groundwater program data and a groundwater remediation status update, and interviewed staff to verify that the licensee was monitoring and evaluating groundwater wells quarterly, per Chapter 9 of the license application. Additionally, the inspectors verified that the licensee, to the extent practical, conducted operations to minimize the introduction of residual radioactivity into the local environment surrounding the facility, including subsurface soil and groundwater, in accordance with 10 CFR 20.1406.

b. Conclusion

No violations of more than minor significance were identified.

C. Facility Support

1. Resident Inspection Program – Post-Maintenance Testing (Inspection Procedure 88135.19)

a. Inspection Scope

The inspectors reviewed records for a sample of post-maintenance tests (PMTs) to verify that procedures and test activities confirmed the operability and functional capability of safety systems and components (SSCs) following the described maintenance.

The inspectors reviewed the licensee's completed test procedures for select PMTs to verify that 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 reviewed test data to verify that test results adequately demonstrated restoration of the affected safety function(s). The inspectors conducted field observations to verify that PMT activities were conducted in accordance with applicable work order instructions or licensee procedural requirements. Furthermore, the inspectors reviewed PIRCS entries to verify that problems associated with PMTs were identified and entered into the system for resolution.

The safety-related equipment (SRE) tests selected for review were N302XXXXLSHNIA1 and N302XXXXLSHPAW3.

b. Conclusion

No violations of more than minor significance were identified.

2. Resident Inspection Program – Surveillance Testing (Inspection Procedure 88135.22)

a. Inspection Scope

The inspectors reviewed completed test data for the surveillance tests of risk-significant and/or safety-related systems listed below to verify that the tests were consistent with the ISA, licensee commitments, and licensee procedures. The inspectors reviewed testing to determine if the SSCs were operationally capable of performing their intended safety functions and fulfilling the intent of the associated SRE test requirement. The inspectors reviewed operator qualifications to verify that staff were qualified in the test areas.

The SRE tests selected for review were N333XSCREEN3A01 and N110BXDSPRINKLR.

b. Conclusion

No violations of more than minor significance were identified.

3. Resident Inspection Program – Problem Identification Resolution and Correction System Review (Inspection Procedure 88135)

a. Inspection Scope

The inspectors reviewed the implementation of licensee corrective actions through the PIRCS to ensure that items adverse to safety were being identified and tracked to closure in accordance with the license application and program procedures. The inspectors routinely reviewed the results of daily PIRCS screening committee 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 in the PIRCS to identify repetitive equipment failures or specific human performance issues adverse to safety for follow-up. The inspectors reviewed PIRCS entries that occurred during the inspection period to determine whether the licensee prioritized the issues commensurate with their safety significance. Additionally, the inspectors verified whether the licensee was implementing measures to prevent recurrence in accordance with the license application.

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 requiring action into PIRCS. Specifically, the inspectors reviewed the following:

- Recommendations associated with the fire hazard analysis for the Building 105 Laboratory
- Biannual Effluent Monitoring Report January to June 2020

b. Conclusion

No violations of more than minor significance were identified.

4. Resident Inspection Program – Emergency Preparedness Drill (Inspection Procedure 88135)

a. Inspection Scope

On September 22, 2020, the inspectors observed an emergency training drill to verify that the licensee's response, inter-departmental coordination, and procedural implementation were consistent with the emergency preparedness objectives of NFS-GH-903, "Emergency Plan."

b. Conclusion

No violations of more than minor significance were identified.

5. Plant Modifications – Triennial (Inspection Procedure 88072, Onsite Inspection)

a. Inspection Scope

The inspectors reviewed the licensee's configuration management program to determine whether the licensee established a process to evaluate, implement, and track cumulative modifications to the facility in accordance with 10 CFR 70.72 and the license application, Chapter 11, "Management Measures." The inspectors reviewed configuration management procedures and interviewed licensee senior managers, supervisors, and engineers to verify that the configuration management program was being implemented in accordance with the applicable requirements.

The inspectors reviewed a selection of plant modification packages (i.e. Engineering Change Requests or ECRs) to determine whether the licensee was implementing their configuration management program as described in the license application, program procedures, and as required by 10 CFR 70.72 and 10 CFR 70.62(d). Specifically, the inspectors holistically reviewed ECRs associated with the Building 301 Receipt Calciner and Enclosure 9901 in Area 900 to verify an adequate technical basis was established and the design assumptions were accurate for the modifications as required by 10 CFR 70.72. The inspectors reviewed the ECRs to ensure modifications to the Building 301 Receipt Calciner, the Enclosure 9901 in Area 900, and their respective interfaces with other systems did not adversely impact the safety basis of the ISA or safety programs as required by 10 CFR 70.72(a)(6), or invalidate the natural phenomena hazards (NPH) structural analysis as required by 10 CFR 70.62(c). The inspectors also verified the program had adequate provisions in place to prevent plant modifications from degrading performance capabilities of IROFS or other safety controls that were part of the safety design basis.

The inspectors reviewed open work requests and temporary operating instructions for the Building 301 Receipt Calciner and Enclosure 9901 in Area 900, and interviewed plant staff to determine if the selected modifications were operated outside of their normal configuration and whether there was any adverse impact to the system's safety basis.

The inspectors verified that selected plant modifications met the design criteria specified in applicable modification packages. The inspectors reviewed a sample of 10 CFR 70.72 evaluations for changes made to the Building 301 Receipt Calciner and Enclosure 9901 in Area 900 to determine whether the licensee adequately evaluated the need for NRC pre-approval of select facility modifications. The inspectors reviewed applicable design basis documents to determine whether the licensing documents had been updated or were in the process of being updated promptly to reflect the modifications as required by 10 CFR 70.72(e). The inspectors reviewed the licensee's document retention practices and procedures to verify compliance with the record retention requirements in 10 CFR 70.72(f). The inspectors also reviewed the training records of licensee personnel conducting the 10 CFR 70.72 evaluations to verify they were qualified to perform the evaluations in accordance with procedural requirements.

The inspectors also reviewed the selected modifications to verify the licensee properly classified minor and administrative modifications in accordance with the license application, Chapter 11, "Management Measures" and to verify the design basis, licensing basis and performance capabilities of IROFS had not been degraded through the modifications.

The inspectors performed walk-downs and reviewed post-modification testing documentation related to the selected modifications to verify that the system condition and tested capability were appropriate and consistent with the design basis and system functionality. The inspectors reviewed post-modification testing procedures and test results to verify the acceptance criteria for system parameters were met and valid, no unintended system interactions occurred, and IROFS performed their intended safety functions as required by 10 CFR 70.62(d). The inspectors compared the field condition with the modification packages to verify the following: the modifications were implemented in accordance with the approved design documents in the modification packages, the assumptions in the ISA were valid based on the actual configurations, and that operation of the modified processes and their management measures could be accomplished as assumed in the ISA to ensure the IROFS were available when needed.

The selected modifications included instrumentation and controls changes associated with the Building 301 Receipt Calciner and Enclosure 9901 in Area 900 to verify that the licensee had adequately established set points to prevent exceeding criticality or chemical safety exposure limits. The inspectors reviewed records and calibration stickers to verify that the measuring and test equipment used in the surveillances was properly calibrated in accordance with licensee application requirements.

The inspectors reviewed the most recent audit of the licensee's configuration management program to verify that the licensee identified issues and entered them into the PIRCS in accordance with Chapter 11 of the license application. The inspectors also reviewed the licensee's PIRCS to verify that issues related to the preparation and installation of plant modifications were properly categorized and addressed consistent with Chapter 11 of the license application.

b. Conclusion

No violations of more than minor significance were identified.

D. Other Areas

1. Licensee-Identified Violation Associated with SNM Spill in Building 302, Area 200

a. Inspection Scope

The inspectors followed up the licensee's response to a spill of SNM that occurred on August 31, 2020 in Building 302, Area 200. The inspectors interviewed licensee personnel, reviewed corrective action records, and directly observed response activities in the affected process areas to verify the licensee maintained the applicable safety controls required by 10 CFR 70.

b. Conclusion

The inspection resulted in a licensee-identified, Severity Level IV, NCV of NRC requirements. The violation is described below.

1) (CLOSED) Failure to Maintain Administrative IROFS Controls (NCV 2020003-001)

As required by 10 CFR 70.62(d), the licensee shall establish management measures to ensure that controls identified as IROFS are designed, implemented, and maintained as necessary, to ensure they are available and reliable to perform their function when needed to comply with the performance requirements of 10 CFR 70.61.

Contrary to this requirement, on September 2, 2020, the licensee identified that the established management measures for IROFS-HC-18 did not ensure this control was implemented and maintained to ensure it was available and reliable to perform its function when needed to comply with the performance requirements of 10 CFR 70.61.

Specifically, procedure NFS-HS-CL-10, "Nuclear Criticality Safety Fuel Manufacturing Facility," Revision 31, Sections 4.4.7 and 4.4.9 for IROFS-HC-18 requires administrative control of the placement of a quantity of licensed material mass by directing the maximum number of temporary storage locations that can be in the same location and the distance that must be maintained between grouped containers. In one instance, the licensee identified that the number of containers with licensed material that could be placed in a temporary location exceeded the limits established for IROFS-HC-18. The licensee entered the issue in the problem identification and resolution program (PIRCS 80423) and took prompt corrective actions to restore compliance with the IROFS limits once the non-compliance was identified. The inspectors determined that there were no actual safety consequences since additional safety controls were maintained to meet the performance requirements of 10 CFR 70.61(b).

This is a Severity Level IV violation consistent with Example 6.2.d.1 of the NRC Enforcement Policy. In accordance with Section 2.3.2.b of the Enforcement Policy, this violation is dispositioned as an NCV because the licensee identified and corrected the violation, and because the violation was not repetitive or willful. This violation will be tracked as NCV 2020003-01, "Failure to Maintain Administrative IROFS Controls."

2. Quarterly Resident Inspector Observations of Security and Material Control and Accounting Personnel and Activities

a. Inspection Scope

During the inspection period, the inspectors reviewed actions performed by security and material control and accounting personnel to verify the activities were consistent with applicable license, procedure, and regulatory requirements.

These quarterly resident inspectors' observations of security force personnel and activities did not constitute any additional inspection samples. Rather, they were considered an integral part of the inspectors' normal plant status reviews and inspection activities.

b. Conclusion

No violations of more than minor significance were identified.

E. Exit Meetings

The inspection scope and results were presented to Mr. John A. Stewart, President of Nuclear Fuel Services, Inc. and members of his staff at exit meetings conducted on August 20, 2020; August 27, 2020; September 17, 2020; and October 20, 2020. Proprietary information was discussed, but not included in this report.

SUPPLEMENTAL INFORMATION

1. KEY POINTS OF CONTACT

<u>Name</u>	<u>Title</u>
N. Auman	Section Manager, Transportation and Waste Management
T. Blankenship	Senior Waste Management Specialist
N. Brown	Unit Manager, Nuclear Criticality Safety
J. Buckles	Fire Protection Engineer
T. Cloyd	Fire Protection Engineer
D. Coulter	Health Physics Professional
M. Eakin	Engineer, Nuclear Criticality Safety
J. Faddis	Unit Manager, Environmental Safety
C. Hale	Environmental Specialist
E. Hollowell	Engineering
R. Leerssen	Process Engineer
E. Mann	Nuclear Safety Engineer
J. Marshall	Analyst, Criticality Safety
A. Morie	Licensing Manager
S. Morie	Decommissioning Environmental Unit Manager
A. Morris	Integrated Safety Analysis
B. Neff	Process Engineer
R. Rice	Manager, Radiation Protection
S. Sanders	Training Manager
L. Scott	Radiation Monitoring Manager
E. Senter	Senior Technical Specialist, ISA Coordinator
S. Skiles	Acting Manager, Nuclear Criticality Safety
J. Stewart	President, Nuclear Fuel Services
R. Storey	Manager, Configuration Management Section

2. LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Opened & Closed

70-0143/2020003-01	NCV	Failure to Maintain Administrative IROFS Controls (Section D.1)
70-0143/2020003-02	VIO	Failure to Comply with Procedural Requirements for Operations in Area 200 (Section A.1.b)

3. INSPECTION PROCEDURES USED

88015	Nuclear Criticality Safety
88030	Radiation Protection (Appendix A)
88035	Radioactive Waste Processing, Handling, Storage and Transportation
88045	Effluent Control and Environmental Protection
88135	Resident Inspection Program for Category I Fuel Cycle Facilities
88135.02	Resident Inspection Program Plant Status Activities
88135.04	Resident Inspection Program Operational Safety
88135.05	Resident Inspection Program Fire Protection
88135.19	Post Maintenance Testing
88135.22	Surveillance Testing
88072	Plant Modification (Triennial)

4. DOCUMENTS REVIEWED

Records:

21T-20-0448, Nuclear Criticality Safety Audit of the Nuclear Criticality Safety Evaluation for 6-Inch Rocket Storage In 105 Laboratory Revision (Rev.) 1, Completed on April 20, 2020
3 yd³ Bulk Bag and Inner Liner 10402238 Container Inspection Checklist
54T-13-0019, Nuclear Criticality Safety Evaluation for the Dissolution of Uranium and High Enriched Uranium Storage Columns, Rev. 20
54T-17-0006, Nuclear Criticality Safety Evaluation for the 301 Receipt Calciner Furnace, Rev. 7
54T-17-0007, Control Flowdown and Field Verification for the 301 Receipt Calciner Furnace, dated November 3, 2017
54T-18-0001, Nuclear Criticality Safety Evaluation Utility Backflow Protection – Plant Air, Nitrogen, DI Water, Rev. 0
54T-19-0003, Control Flowdown and Field Verification for the BPF Uranium Dissolution System and High Enriched Uranium Storage Columns
55-gallon drum 8200487: Category 2 Inspection, Container Inspection Checklist, and Certificate of Compliance, dated August 20, 2014
71T-10-0167, Joint Test Group Program, Rev. 0, November 2010
Bioassay Records from 09/01 and 09/02
Certificate of Compliance for Drum 430006334, dated August 11, 2020
Container Inspection Checklist FM-WST-016, Rev. 5, 55-gallon drum 430006334 dated April 2013
In Vivo Analysis Report – 15304
Instrument List Selection, Nuclear Fuels Services, dated September 14, 2020
LOA-2142Q-045, Receipt Calciner Muffle Cleanout, dated April 2013
LOA-2142Q-047, Sorting of Clinkers and Screenings Trash for Inventory and Disposal,
LOA-2219U-008, Reactivation of LOA-2142Q-059, dated February 2014
LOA-2266W-012, Clean Filter Processing through Receipt Calciner, dated May 2015
LOA-2284X-001, ECR 20161132 (Enclosure 9901), dated August 24, 2018
LOA-2284X-002, ECR 20161132 (Enclosure 9901), dated March 29, 2019
New 55-gallon drum 10137263: Cat 2 Inspection Documentation, Container Inspection Checklist, and Certificate of Compliance, dated October 9, 2019
New 55-gallon Drum 10394666: Category 2 Inspection and Container Inspection Checklist, dated June 18, 2020
NFS-CM-004, NFS Change Control Process, Rev. 20
NFS-GH-28, Employee Contamination Report, Rev. 17
NFS-GH-44, Evaluation and Implementation of Internally Authorized Changes (IAC),
NFS-GH-901, Configuration Management Program, Rev. 22
NFS-HS-A-67, Documenting the Safety and Regulatory Review of Facility Changes, Rev. 15
NFS-ISA-QUALP, Integrated Safety Analysis and Fire Protection Qualification Program, Rev. 3, dated March 2019
Personnel Monitoring Employee Contamination Report, NFS-GH-28, Rev. 17 for PIRC 80394
Personnel Monitoring Employee Contamination Report, NFS-GH-28, Rev. 17 for PIRC 80396
Personnel Monitoring Employee Contamination Report, NFS-GH-28, Rev. 17 for PIRC 80397
Personnel Monitoring Employee Contamination Report, NFS-GH-28, Rev. 17 for PIRC 80408

Personnel Monitoring Employee Contamination Report, NFS-GH-28, Rev. 17 for PIRC 80409
Receipt inspection Plan for Mauser UN Rated 55 Gallon Steel Drum 4300061334-0N05, dated August 20, 2020, Rev. 16
Safety Work Permits: 20-09-020, 17661, 17662
SOP-401-15G, FMF, Area 900 Process Cleaning (U), Rev. 12, dated January 2019
SOP-409 Section 71, 301 Receipt Calciner, Rev. 13, dated November 2012
SOP-409 Section 71, 301 Receipt Calciner, Rev. 14, dated December 2012
SOP-409 Section 71, 301 Receipt Calciner, Rev. 15, dated July 2013
SOP-409 Section 71, 301 Receipt Calciner, Rev. 21, dated February 2016
SOP-409 Section 71, 301 Receipt Calciner, Rev. 26, dated March 2019
SOP-409 Section 71, 301 Receipt Calciner, Rev. 5, dated May 2012
SOP-409-4, Operation of Scales BPF Facility, Rev. 10, dated July 2013
Summary of Alpha Samples August 30, 2020 through September 14, 2020 -- 302
Survey of Alpha Samples August 30 to September 14

Procedures:

NFS-GH-01, Contamination Control, Rev. 36, dated July 24, 2020
NFS-GH-03, Safety Work Permits, Rev. 21, dated December 16, 2019
NFS-GH-28, Employee Contamination Report, Rev. 17
NFS-HS-A-01, Plant Action Limits and Investigation for Bioassay Measurements, Rev. 8, dated August 4, 2017
NFS-HS-B-18, Collection and Analysis of NFS Stack Samples, Rev. 27, dated May 1, 2019
NFS-HS-B-20, Routine Sampling of Environmental Media, Rev. 25, dated July 17, 2017
NFS-HS-B-30, Performing Personnel Decontamination, Rev. 10, dated July 24, 2020
NFS-HS-B-31, Performing Survey Releases, Rev. 13, dated April 01, 2020
NFS-HS-B-80, Contamination Surveys, Rev. 13, dated April 26, 2017
NFS-HS-E-02, Emergency Criticality Evacuation, Rev. 048
NFS-HS-E-15, Emergency Medical Response, Rev. 019
NFS-NCSE-NCSA WG, Nuclear Criticality Safety Evaluation/Analysis Writer's Guide, Rev. 11, dated August 12, 2020
NFS-WST-022, Waste Packaging Selection, Procurement, and Inspection, Rev. 16,
NFS-WST-031, Waste Packaging for Disposal inside the MAA, Rev. 18, dated July 10, 2020
NFS-WST-036, Handling and Packing of the Versa-pac, Rev. 4, dated May 4, 2020
SOP-335A, General Requirements for Waste Handling and Packaging, Rev. 21, dated August 5, 2019
SOP-335K, NNSS Certification and Shipping Documentation, Rev. 22, dated February 25, 2019
SOP-401-02-302, BLDG. 302 Area 200, Rev 051E
SOP-409, Section 8, U-Oxide Dissolution, Rev. 72
WST-20-015, Certification of shipments going to Energy Solutions, dated August 15, 2020
WST-SWI-20-010 CDL Filtrate, Offloading, Handling, and Inspection, dated June 15, 2020
WST-SWI-20-017, Repackaging CDL Filtrate into 6-pack Supersacks, dated August 6, 2020

Drawings:

17 HD 150, Fluid Seal, Bag-in/Bag-out 304L Redundant Filtration System
301-E3162-D, 301 Calciner Glovebox Lights and Control Layout Dwg
301-E3168-D, 301 RFS Calciner Pusher Encoders and Tray Position Laser
301-F0100-D, 301 Calciner Inlet Enclosure P&ID, dated August 2013
301-F0102-D, 301 Receipt Calciner

301-F0103-D, 301 Calciner Tray Cooling Station
301-F0254-D, Scrubber Header
301-F0274-D, 301 Receipt Calciner
301-H5018-D, RFS Calciner Process Ventilation
301-H5019-D, RFS Calciner Process Ventilation
301-M4205-D, Inlet Enclosure Glovebox Details - 301 Calciner – March 2018
301-M4247-D, Tray Location Sensor Assy Calciner Furnace B-301
303-P2033-D, ENCLOS-9901 PA and N2 Isometric

Engineering Change Requests:

ECR-20120207, Incorporate Changes from NCSE into SOP-409, Sec 71 and other findings from Testing and Training, dated February 2012
ECR-20120514, Replace existing mechanical limit switch assembly with new assembly having different arrangement that will better protect switches from damage, dated April 2012
ECR-20120888, Replace Existing Receipt Calciner Muffle Ventilation POG Blower with Larger Blower, dated July 2012
ECR-20121270, New Authorized Material Input: U-Carbide, dated October 2012
ECR-20121326, Allow processing of TMT Clinkers and Screenings Material in 301 and 333, dated October 23, 2012
ECR-20121412, Revision of SOP-409, Section 71, dated November 2012
ECR-20130374, LOA-2142Q-045, Receipt Calciner Muffle Cleanout, dated March 2013
ECR-20130407, LOA-2142Q-047 Sorting of Clinkers and Screenings Trash for Inventory and Disposal, dated April 2013
ECR-20130572, Processing of U-Metal in the Receipt Calciner, dated May 2013
ECR-20130572-01, Update NCSE-CDL-CART-AND-RACK Rev. 3, dated July 2013
ECR-20130572-03, Update NFS-HS-CL-2601 from Rev. 13 to Rev. 14, dated July 2013
ECR-20130709, Install Scale in Inlet Enclosure for Receipt Calciner, dated June 2013
ECR-20130965, Processing TMT Alloy Groups 12 and 13 Oxidation Through Downblending, dated August 2013
ECR-20140116, LOA-2219U-008, Reactivation of LOA-2142Q-059, dated January 2014
ECR-20150185, Test Unused Filters Through 301 Calciner as Part of Heritage Filter Recovery, dated February 10, 2015
ECR-20150185-01, New LOA-2266W-012 Processing Filter Media Through 301 Calciner, dated May 7, 2015
ECR-20150568, LOA for RPU operation in Enclosure 9901, dated April 28, 2015
ECR-20150646, Install RPU in 303-ENCLOS-9901, dated April 28, 2015
ECR-20151046, Modification and Testing of 9901, dated August 2015
ECR-20151194, Requesting authorization to process filters through BPF, dated September 10, 2015
ECR-20151268, LOA to Process Filters from Single 3MT Shipment, dated September 29, 2015
ECR-20151410 (Enclosure 9901), dated November 3, 2015
ECR-20160055, Remove Calciner Range Laser, dated January 2016
ECR-20161132 (Enclosure 9901), dated September 29, 2016
ECR-20161132-02 (Enclosure 9901), dated June 18, 2018
ECR-20161132-04 (Enclosure 9901), dated September 11, 2018

ECR-20170051, The B301 Calciner Muffle is to be replaced with a newly designed muffle with a new alloy and additional NDA scan ports, dated January 11, 2017
ECR-20170051-01, PVC mockup of the Bldg 301 muffle replacement, dated May 11, 2017
ECR-20170051-02, FCR for Minor Changes retention plate to alleviate potential binding, dated September 18, 2017
ECR-20170051-03, Filler plate will be machined and fit to match an unintended open area to restore the muffle inlet height, dated September 19, 2017
ECR-20170518, Drawings for the 301 Calciner Muffle Replacement do not reflect field conditions, dated April 10, 2017
ECR-20170868, 301 Receipt Calciner Ventilation Upgrade, dated June 2017
IAC-874, Oxidizing U-Metal Alloys in 301 Receipt Calciner, dated May 2013

Integrated Safety Analysis Documents:

21T-13-0012, CD Line Integrated Safety Analysis Summary, Rev. 5, dated January 2013
21T-14-0002, Blended Low-Enriched Uranium Preparation Facility Integrated Safety Analysis Summary, Rev. 11, dated January 2014
21T-14-0004, CD Line Integrated Safety Analysis Summary, Rev. 6, dated January 2014
21T-17-0093, CD Line Integrated Safety Analysis Summary, Rev. 9, dated January 2017
21T-20-0002, Blended Low Enriched Uranium Preparation Facility, Rev. 17, dated January 2020
21X-09-0002, 300 Complex Production Areas 100 to 900, Rev. 15, dated January 2019
21X-09-0002, 300 Complex Production Areas 100 to 900, Rev. 5, dated January 2009

Nuclear Criticality Safety Evaluations (NCSE):

54T-12-0011, Nuclear Criticality Safety Evaluation for the 301 RFS Calciner Furnace, Rev. 1, dated April 2012
54T-12-0018, Control Flowdown and Field Verification for the 301 RFS Calciner Furnace, Rev. 1, dated April 2012
54T-13-0013, Nuclear Criticality Safety Evaluation for the 301 RFS Calciner Furnace, Rev. 5, dated June 2013
54T-17-0006, Nuclear Criticality Safety Evaluation for the 301 Receipt Calciner Furnace, Rev. 7, dated September 2017
54T-17-0007, Control Flowdown and Field Verification for the 301 Receipt Calciner Furnace, Rev. 7, dated November 2017
54X-17-0002, Nuclear Criticality Safety Evaluation for ENCLOS-5901/-9901 in Area 900 of the Fuel Manufacturing Facility, Rev. 4

Problem, Identification, Resolution, and Correction System (PIRCS) Documents Reviewed:

24665, 26368, 29143, 35441, 65586, 67835, 70451, 72042, 72167, 72299, 75866, 76562, 78876, 79001, 79244, 79472, 79631, 79654, 79663, 79737, 79807, 79872, 79855, 79862, 79953, 80026, 80027, 80074, 80081, 80084, 80166, 80214, 80238, 80246, 80330, 80336, 80393, 80394, 80397, 80402, 80406, 80408, 80409, 80417, 80423, 80527, 80530, and 80551.

Other Documents:

302 7-day Air Sampling Data, Respirator corrected DAC Hours
53T-15-0013, Final Report: Uranium Recovery from Process Filters, dated March 9, 2015
55T-15-0160, 301 Receipt Calciner Performance Qualification for Filter Processing
55T-15-0161, Final Report: Clean Filter processing Through 301 Receipt Calciner, dated September 30, 2015
71T-12-0076, Operational Qualification of Receipt Calciner Laser Sensor (Tray Present), Material Handling Pusher Encoders, Larger Fans – Radiant Heat/Air Cushion, PLC Updates, Rev. 0, dated April 2012
71T-17-0237, Receipt Calciner HEPA Filter Housing Seismic Calculation, Rev. 0, dated January 2019
71T-19-0013, 301 Calciner Exhaust Filter House Site Acceptance Test Report, dated January 14, 2019
BPF-PO-8, 301 Receipt Calciner Process Outline, Rev. 4
CEA-12-085, Technology Review of Clinkers & Screenings for Calcination – 12MT, dated October 30, 2012
CEA-12-087, Release of Clinkers & Screenings for Calcination – 12MT, dated November 5, 2012
Configuration Management Program - Quality Assurance Audit (QA-20-05), dated March 2020
Core Competency – Nuclear Criticality Safety (NCS Training Material)
Engineering Training and Qualification Summary Document for Process Engineers B. Neff and R. Leerssen, dated July 20, 2020
Groundwater Remediation Status Update – September 2020
Health and Safety Contamination Report HEA-02-01-21 302 investigative from August 31, 2020 through September 11, 2020
Health Physics Personnel Contamination Event Performance, dated August 2020
HEU-11-02-02 Final Report: Uranium Recovery from Process Filters, dated March 2015
ISA Qualification Documentation for E. Senter, A. Morris, and J. Marshall
List of ECRs for the Building 301 Receipt Calciner from 2009 to 2020
LOA 2340A-039, Authorization to Operate Area 200
NCS Biennial Audit Completed YTD 2020
NFS-HS-CL-10-09, Nuclear Criticality Safety Building 302, 303, 306, AND 307 – Area 900 (U), Rev. 28
NFS-HS-CL-28-11, Nuclear Criticality Safety 301 RFS Calciner Furnace and Supporting Enclosures, Rev. 4, dated November 2012
NFS-HS-CL-28-11, Nuclear Criticality Safety 301 RFS Calciner Furnace and Supporting Enclosures, Rev 5, dated December 2012
NFS-HS-CL-28-11, Nuclear Criticality Safety 301 RFS Calciner Furnace and Supporting Enclosures, Rev 6, dated July 2013
NFS-HS-CL-28-11, Nuclear Criticality Safety 301 RFS Calciner Furnace and Supporting Enclosures, Rev 2, dated May 2012
Partial Release of Other Oxides for Calcination from 741 Forms 123, 131, 136, and 138-12 Metric Ton Contract
POSTING CL-26-02, ENCLOS-3A18/3B18 – Uranium Dissolution, Rev. 12
Release of Other Oxides for Dissolution 741 Forms 114, 123, 130, 131, 136, 138 – 12MT
Routine Groundwater Program Data, 2019 to Current
RPS-15-006, Technology Review Clean Filter Media Test – 12MT, dated October 30, 2012
RPS-15-029, Technology Review BPF Filter Processing, dated October 15, 2015
Safety & Safeguards Review Council (SSRC) Minutes dated November 1, 2012

Technical Basis for ECR 20121412, Processing U Carbide Compounds in the Receipt Calciner, dated November 2012

Technical Basis for ECR 20161132, dated February 25, 2019

Technology Review of ECR 20161132, dated February 23, 2017

Technology Review of Other Oxides for Dissolution 741 Forms 114, 123, 131, -12MT

Test Plan for ECR 20161132, dated January 6, 2017

TP-20150002, 301 Receipt Calciner Performance Qualification for Clean Filter Media Processing

WR 291310, Replace pusher ball screw nut and linear bearings, dated August 19, 2020 (In-Progress)