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

October 31, 2013

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

SUBJECT: NUCLEAR REGULATORY COMMISSION INTEGRATED INSPECTION REPORT NUMBER 70-143/2013-004

Dear Mr. Henry:

This refers to the inspections conducted from July 1, 2013, to September 30, 2013, at the Nuclear Fuel Services (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 Nuclear Regulatory Commission (NRC) requirements. The enclosed report presents the results of these inspections. The findings were discussed with you and members of your staff at an exit meeting held on October 10, 2013.

During these inspections, the 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 examinations of procedures and representative records, observations of activities, and interviews with personnel.

Based on the results of these inspections, no cited violations or deviations were identified.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document 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 us.

Sincerely,

/RA/ C. Taylor for

Alan J. Blamey, Chief
Fuel Facility Inspection Branch 1
Division of Fuel Facility Inspection

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

Enclosure:
NRC Inspection Report 70-143/2013-004
w/Attachment: Supplemental Information

cc: (See page 3)

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Sincerely,
/RA/ C. Taylor for

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cc: (See page 3)

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U. S. NUCLEAR REGULATORY COMMISSION
REGION II

Docket No.:	70-143
License No.:	SNM-124
Report No.:	70-143/2013-004
Licensee:	Nuclear Fuel Services, Inc.
Facility:	Erwin Facility
Location:	Erwin, TN 37650
Dates:	July 1 through September 30, 2013
Inspectors:	C. Stancil, Senior Resident Inspector M. Toth, Resident Inspector B. Prince, Senior Fuel Facility Inspector P. Startz, Fuel Facility Inspector R. Russell, Fuel Facility Inspector
Approved by:	A. Blamey, Chief Fuel Facility Inspection Branch 1 Division of Fuel Facility Inspection

Enclosure

EXECUTIVE SUMMARY

Nuclear Fuel Services (NFS), Inc.
NRC Integrated Inspection Report 70-143/2013-004
July 1 – September 30, 2013

Inspections were conducted by resident and regional inspectors during normal and off-normal shifts in the areas of safety operations, radiological controls, and facility support. The inspectors performed a selective examination of licensee activities which were 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.

Safety Operations

- Plant operations were performed safely and in accordance with license requirements (Paragraph A.1).

- Nuclear criticality safety controls were followed throughout the facility (Paragraph A.2).

- Fire safety program was adequately implemented in accordance with license and regulatory requirements (Paragraph A.3).

- Operations were conducted safely and in accordance with the license (Paragraph A.4).

Radiological Controls

- The licensee adequately implemented the radiation protection program consistent with the license and regulatory requirements (Paragraph B.1).

- The NRC reviewed the results of the NRC independent analysis of surface water samples and determined that the results were within regulatory requirements (Paragraph B.2).

- The Environmental Protection program was implemented in accordance with the license and regulatory requirements (Paragraph B.3).

Facility Support

- The Emergency Preparedness program was implemented in accordance with the license and regulatory requirements (Paragraph C.1).

- The Configuration Management program was implemented in accordance with license requirements (Paragraph C.2).

- A nitrogen oxide (NO_x) system modification to U-Oxide 333 was implemented in accordance with license requirements (Paragraph C.3).

- Adverse conditions were adequately identified, evaluated, and entered into the corrective action program (Paragraph C.4).

Other Areas

- The licensee adequately maintained radiological programs that minimized radiological site contamination and remediation, ensured prompt identification, characterization and documentation of radioactive environmental releases, and maintained the required financial assurance documentation in accordance with the Decommissioning Planning Rule (Paragraph D.1.)

Attachment:
Key Points of Contact
List of Items Opened, Closed, and Discussed
List of Inspection Procedures Used
Documents Reviewed

REPORT DETAILS

Summary of Plant Status

The facility began the inspection period with the following process areas operating: 1) Naval fuel manufacturing facility (FMF); 2) Blended Low Enriched Uranium (BLEU) Preparation Facility (BPF) which included the Uranium (U)-Oxide, U-Metal, Solvent Extraction (SX), and the down-blending (DB) lines. Building 301 Commercial Development (CD) line was operated for a period of time to support 301 calciner operations.

A. Safety Operations

1. Plant Operations Routine (Inspection Procedure (IP) 88135)

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 (valves, sensors, instrumentation, in-line monitors, and scales) and items relied on for safety (IROFS).

The routine tours included walk-downs of the BPF, CD line, FMF, storage areas, and the 234 building. The inspectors verified that there was adequate staffing and that operators were attentive to their duties and knowledgeable of the status of alarms and annunciators. The inspectors observed activities during normal and upset conditions for compliance with procedures and station limits. The inspectors noted that safety controls were in place 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 walked down portions of safety-significant operating systems and verified that IROFS were identified and operable. The inspectors reviewed operator log books, maintenance records, and Letters of Authorization (LOA; 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 that required compensatory measures were prescribed and implemented as required.

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. Inspectors focused on potential wind-borne missile hazards, potential fire hazards with combustible material storage and fire loading, hazardous chemical storage, storage of compressed gas containers, and potential degradation of plant security features. In addition, inspectors walked down the licensee's emergency response facilities for familiarization and to ensure the facilities were maintained in a readily available status. During these tours, the inspectors also verified that required Notices to Employees were appropriately and conspicuously posted in accordance with 10 Code of Federal Regulations (CFR) Part 19.11.

The inspectors attended various plan-of-the-day meetings 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.

Safety System Walk-down

The inspectors performed walk-downs of safety-significant systems involved with the processing of SNM. As part of the walk-down, inspectors verified the as-built configuration matched approved plant drawings. The inspectors interviewed operators to confirm that plant personnel were familiar with the assumptions and controls associated with these 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 the systems' ability to perform its functions was 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, the operability of IROFS, safety-related devices, or other support systems essential to safety system performance. Systems in the following areas were examined included:

- Buildings 302 and 303 Area 600
- Building 302 Area 800

To determine the correct system alignment, the inspectors reviewed procedures, drawings, related ISAs, and regulatory requirements such as 10 CFR Part 70.61. During the walk-downs, the inspectors verified all or some of the following as appropriate:

- Controls in place for potential criticality and chemical 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 and functional;
- Lockout/tagout program appropriately implemented;
- Cabinets, cable trays, and conduits correctly installed and functional;
- Visible cabling in good material condition; and
- No interference of ancillary equipment or debris with system performance.

b. Conclusion

No findings of significance were identified.

2. Criticality Safety (IP 88135)

a. Inspection Scope and Observations

During daily production area tours, the inspectors verified various criticality controls to be in place, that personnel followed criticality station limit cards, and that containers were adequately controlled to minimize potential criticality hazards. The inspectors sampled a number of criticality-related IROFS for operability and for adequate identification in the field as well as on drawings. The inspectors noted that operators were knowledgeable of the requirements associated with IROFS. Specific areas included Area 600 in both 302 and 303 buildings and Area 800. Inspectors also walked down the licensee's "lightning" mode of the criticality alarm system.

The inspectors performed several tours inside various process areas when restrictions on SNM movements were in effect.

The inspectors participated in and observed a criticality alarm evacuation on September 25. The inspectors evaluated certain key aspects of the drill including orderly evacuation to designated zones, responsibilities of the fire brigade, and personnel accountability.

b. Conclusion

No findings of significance were identified.

3. Fire Protection Quarterly (IP 88135)

a. Inspection Scope and Observations

During routine plant tours, the inspectors verified that transient combustibles were being adequately controlled and minimized in all process areas. A sample of fire barriers and doors were examined and found to be properly maintained and functional in accordance with site procedures.

Inspectors observed several instances where the licensee implemented their fire response program:

- 302-600 storage chamber boot combustible gas fire
- 306-800D fire from tape under insulation blanket
- Criticality evacuation drill and fire brigade training

Inspectors verified proper donning 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 fire, and utilization of pre-plan strategies.

The inspectors reviewed several active fire impairments during the quarter within the process areas and determined they were implemented per site procedure.

b. Conclusion

No findings of significance were identified.

4. Operational Safety (IP 88020)

a. Inspection Scope and Observations

The inspectors interviewed personnel, reviewed records, and observed normal operations associated with Area 800 in the Naval FMF. The inspectors confirmed that a selection of fire and criticality IROFS were present and in a condition capable of performing their intended safety function(s). The inspectors verified the physical presence of passive and active engineered IROFS by performing independent walk downs of several process systems and comparing piping layouts and component locations to the current piping and instrumentation diagrams (P&IDs) for the area.

The inspectors determined that the licensee's administrative controls were adequately implemented and communicated to personnel. The inspectors reviewed the area standard operating procedure (SOP), operator logs, station limit cards, and training modules and determined that required actions and limits as identified in the ISA Summary have been correctly transcribed into written operating procedures.

The inspectors interviewed several operators on various shifts and determined knowledge levels regarding process operations and implementation of safety controls were adequate. The inspectors observed operators' performance and determined they were adhering to applicable procedures and responded in a timely fashion to process alarms. The inspectors reviewed the postings and operator aids applicable to the tasks being observed and determined they were current and were followed by the operators. The inspectors observed several operators taking required equipment logs. The operators were able to explain the purpose of the readings, including readings designated as IROFS, and recorded the information at the proper frequency.

The inspectors verified that the licensee conducted surveillances, functional testing and calibrations as required by the ISA Summary for the selected fire safety and nuclear criticality safety controls and equipment. A selection of records was reviewed to confirm completion in the appropriate periodicity.

The inspectors reviewed the licensee's corrective action program entries for the past several months related to the process area and determined issues were entered at the appropriate threshold. The inspectors evaluated corrective actions associated with a selection of program entries and determined they were adequate.

The inspectors determined that IROFS are being adequately implemented and communicated as described in the ISA. The inspectors determined that the licensee is operating safely and in compliance with license requirements.

b. Conclusion

No findings of significance were identified.

B. Radiological Controls

1. Radiation Protection Quarterly (IP 88135)

a. Inspection Scope and Observations

During tours of the production areas, 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 Radiation Work Permits (RWPs). 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 reviewed RWPs and associated contamination tent safety work permits (SWPs) for the Building 301 calciner process cleanout and Building 303 Area 600 repairs.

b. Conclusion

No findings of significance were identified.

2. Environmental Protection (IP 88135)

a. Inspection Scope and Observations

The NRC inspectors reviewed the independent sampling results collected by Oak Ridge Associated University (ORAU) on June 12, 2013 and compared the data to the licensee's sampling results for samples collected on the same day. The NRC and the licensee conducted split samples for surface water at four locations. The sampling locations correspond to locations on the Nolichucky River and Martin's Creek that were upstream and downstream of the facility.

The NRC inspectors verified that the results for NRC independent sampling and the licensee sampling were less than the investigation levels stated in approved procedures. The analytical results for the surface water samples are shown in Figure 1. The measurement uncertainty and the minimum detectable concentration (MDC) values are also reported for each analysis.

Figure 1: The NRC and licensee sampling results for gross alpha and gross beta analysis in local surface water taken on June 12, 2013.

		NRC (ORAU)			NFS		
Sampling Location	Analysis	Result pCi/L	Uncertainty pCi/L	MDC pCi/L	Result pCi/L	Uncertainty pCi/L	MDC pCi/L
Nolichucky River Upstream	Gross Alpha	0.19	0.19	0.31	0.226	0.452	1.79
	Gross Beta	2.24	0.52	0.76	1.17	0.74	2.46

		NRC (ORAU)			NFS		
Sampling Location	Analysis	Result pCi/L	Uncertainty pCi/L	MDC pCi/L	Result pCi/L	Uncertainty pCi/L	MDC pCi/L
Nolichucky River Downstream	Gross Alpha	0.31	0.22	0.32	1.23	0.55	1.54
	Gross Beta	6.30	0.65	0.76	1.56	0.59	1.78
Martin's Creek Upstream	Gross Alpha	0.35	0.23	0.32	0.171	0.398	1.66
	Gross Beta	2.06	0.52	0.76	1.74	0.67	2.05
Martin's Creek Downstream	Gross Alpha	1.11	0.36	0.37	2.04	0.65	1.38
	Gross Beta	2.33	0.53	0.77	1.44	0.58	1.75

Inspectors also reviewed the licensee's Quarterly Radiological Liquid and Gas Effluents Report, dated June 4, 2013, for potentially significant trends.

b. Conclusion

No findings of significance were identified.

3. Environmental Protection (IP 88045)

a. Inspection Scope and Observations

The inspectors interviewed licensee staff on environmental program changes made during the last year and determined that the program functions remained in compliance with the license application. The inspectors verified that there were no significant organizational changes in the last year. The inspectors reviewed the most recent internal audits and self-assessments performed by the licensee since the last inspection. The audits and assessments included monthly environmental inspections and environmental safety quarterly audits prior to May 2013. The inspectors determined that the licensee performed these at the stated frequency, with the appropriate scope, documentation and resolution of items.

The inspectors observed the collection of samples from the sanitary sewer and storm water discharge channels, and determined the sampling activities were performed in accordance with approved procedures and industry practices. The inspectors examined upgraded liquid effluent sampling equipment and determined the equipment was operating properly. The inspectors observed the calibration technique for the flow proportional sampler and determined that it was properly calibrated. The inspectors reviewed 2012 records for the sanitary sewer discharge and determined that the water discharged to the municipal sewage treatment system was less than regulatory radiological limits and remained in compliance with 10 CFR Part 20.2003. The inspectors reviewed monthly averages for Waste Water Treatment Facility liquid effluent discharges to the Nolichucky River for 2012 and 2013, and determined that the radiological content in the discharges was less than the federal regulatory limit.

The inspectors accompanied the licensee staff during the routine collection of stack samples and determined that the licensee performed this task as required by NFS-HS-B-18, “Collection and Analysis of NFS Stack Samples.” The inspectors determined that the licensee was in compliance with both the approved procedures and license application. The inspectors interviewed licensee staff collecting the filters regarding calibration of equipment, inspection of the sampling systems, and reporting results. The staff demonstrated adequate knowledge about the systems and sampling activities. During walk downs, inspectors verified that detectors were calibrated, valves were checked and equipment was maintained as required by procedure.

The inspectors observed the collection of ambient air sampling filters and verified the monitoring locations. The inspector reviewed calibration records for replacement air sampler pumps for two environmental air sampling stations (Stalling Lane and Little Mountain). The air samplers were procured to replace older model air sample pumps. The inspectors noted that appropriate calibration records were provided by the manufacturer. The licensee performed initial calibration of the air samplers in accordance with their program prior to placing the new units in service. The inspectors reviewed calibration records for accuracy and completeness. The inspector observed licensee personnel changing out stack air samples. The inspector noted that the technician observed proper contamination control techniques when replacing stack air sample filters to prevent cross-contamination of samples. Air sampling stations were adequately maintained and equipment was noted to be operable. Data sheets and associated records were completed in accordance with approved procedures.

The inspectors verified that the licensee was maintaining records and reports in accordance with 10 CFR Part 20. The inspectors reviewed the latest two complete semi-annual effluent reports for all of 2012 and determined that the licensee remained in compliance with 10 CFR Part 70.59.

The inspectors reviewed the year 2012 environmental sampling results for surface water, sediment, soil, vegetation, and sludge samples. The inspectors verified that sampling was performed at the appropriate frequency and that the sample results were less than the action level required in the license application. The inspectors interviewed environmental management about a routine groundwater sample that indicated a rise in uranium activity above the historical mean concentration. The temporary rise occurred at the North Site Remediation area in 2012. A routine sample of groundwater from well # 98A experienced a temporary increase of uranium activity that was above the historical mean concentration level, but well below regulatory discharge limits. The temporary increase triggered an investigation and additional sampling efforts were conducted. The levels have since decreased back to near the low historical levels. No definite cause was identified. Inspectors reviewed the investigation report concerning the temporary rise at well #98A. The investigation was conducted by the licensee’s environmental contractor ARCADIS. The contractor completed the investigation in 2013, but was unable to identify any significant changes at the site and suggested continued sampling/monitoring.

The inspectors reviewed the semi-annual public dose assessments and determined that the total dose to the hypothetical individual likely to receive the highest dose from licensed operations in 2012, did not exceed the values specified in Appendix B of 10 CFR Part 20. The inspectors reviewed the airborne portion of the public dose

assessment and verified that the calculated exposure was in compliance with the As Low As Reasonably Achievable (ALARA) constraint required by 10 CFR Part 20.1101(d).

b. Conclusion

No findings of significance were identified.

C. Facility Support

1. Emergency Preparedness (IP 88050)

a. Inspection Scope and Observations

The inspectors performed observation of plant activities, conducted personnel interviews, evaluated procedure changes, inspected documentation and determined the NFS' Emergency Preparedness program had been maintained in a state of operational readiness and had been coordinated with off-site support agencies.

The inspectors conducted a review of changes made since the last inspection to the emergency plan to evaluate whether a decrease in effectiveness occurred. The inspector interviewed emergency response staff and reviewed the changes applicable to Revision (Rev.) 17 of the Emergency Plan and determined the changes had been properly coordinated within the emergency preparedness organization. The inspectors determined the changes made since the last inspection resulted in no decrease in effectiveness of the emergency plan and the revised plan continued to meet the licensing commitments and regulatory requirements.

The inspectors observed the fire brigade and the emergency response staff respond to two separate fire alarms the week of the inspection. The inspectors determined the licensee's staff responded in a timely manner, maintained effective command and control, conducted a thorough alarm assessment, maintained effective communications, and conducted in-depth response assessments and critiques. The inspectors reviewed training records and interviewed emergency response organization staff regarding their emergency preparedness roles and responsibilities. The inspectors determined the training provided instructions for potential emergency situations and the individuals responsible for response roles were qualified. The inspectors verified the licensee offered periodic training for off-site responders including fire, law enforcement, emergency services, and medical receipt of contaminated personnel. The inspectors determined emergency preparedness drills and exercises were conducted to test emergency response plans and deficiencies were entered into the corrective action program.

The inspectors reviewed the written off-site support and mutual aid agreements and interviewed a sample of the off-site response agencies and determined they maintained an adequate understanding of the written agreements and commitments. The inspectors interviewed the emergency management staff of the Erwin Fire Department, South Unicoi Volunteer Fire Department, Unicoi County Memorial Hospital, Medic 1 Emergency Medical Services, and the Unicoi County Emergency Management Agency. The inspectors determined the licensee maintained an appropriate working relationship

with off-site agencies, including their involvement and participation in drills and exercises.
The inspectors observed the storage of emergency equipment in response facilities and verified the equipment was maintained in a state of readiness and at acceptable quantity levels and material condition. The inspectors walked down the Emergency Control Center (ECC), the off-site ECC at the Erwin Town Hall, the Emergency Monitoring Supply Center, and the Fire Brigade Building. The inspectors determined the facilities were maintained with appropriate supplies and equipment and were in a state of readiness. The inspectors walked down the evacuation and accountability meeting locations and verified that accountability meeting points were accessible and methods were available to perform timely accountability and mustering during an evacuation.

The inspectors verified problems or deficiencies associated with the emergency equipment and facilities were identified and tracked for correction. The inspectors reviewed the 2012 emergency preparedness quality assurance audit report generated since the last inspection to determine if findings were identified for tracking and resolving.

b. Conclusion

No findings of significance were identified.

2. Permanent Plant Modifications (IP 88070)

a. Inspection Scope and Observations

The inspectors interviewed the Configuration Management Section Manager and his staff members to verify the licensee had established an effective configuration management system to evaluate, implement, and track permanent plant modifications to the site which could affect safety. The inspectors reviewed a selection of plant modifications to evaluate the licensee's implementation of the configuration management system to ensure the modifications did not degrade the performance capabilities of IROFS or other safety controls. The following plant modifications packages were reviewed:

- Modification Package, IAC 868, Supporting Documents: ECR-20121141, 21T-12-1276, authorized October 16, 2012
- Modification Package, IAC 870, Supporting Documents: ECR-20121326, 21T-13-0132, authorized November 9, 2012
- Modification Package, IAC 872, , Supporting Documents: ECR-20121494, 21T-13-0361, authorized December 12, 2012

The inspectors reviewed selected changes made to the ISA summaries that involved changes to the consequence levels for fire and chemical safety accident sequences to validate the changes were properly evaluated and were reflected in the appropriate hazards analysis documents and the as-built plant configuration. The inspector walked down a selection of plant modifications to validate the as-found plant configuration was in agreement with the revised ISA criticality safety evaluation changes. The inspectors reviewed the changes and walked down the affected areas for the laboratories, the

commercial development line and the plant production, recovery, and support system areas to evaluate the implementation of the changes reflected in the ISA summaries. The inspectors reviewed selected change control packages for Internally Authorized Changes (IACs) and for other plant changes and modifications described as minor plant changes. The change packages had adequate provisions to ensure the plant modifications did not degrade the performance capabilities of safety controls or change the safety design basis. The inspectors verified the licensee's work control program had provisions for pre-job planning and the work control packages identified controls such as lockout/tagout (LOTO), and confined space and radiation work permits.

The inspectors conducted a review of the Uranium-Oxide Dissolver System in the BLEU production facility that had recent modifications to the configuration and to the programmable logic control (PLC) system. The inspectors performed walk-downs of the piping and the basic components of the system to validate the as-found configuration matched the approved (P&ID).

The inspectors reviewed selected permanent plant modification change packages initiated since the last inspection for accuracy. The inspectors verified the applicable post installation maintenance and testing requirements were adequately identified, performed, and reviewed prior to placing the modification and affected equipment into service

The inspectors reviewed the licensee's corrective action program to verify that issues relating to the preparation and installation of permanent plant modifications were entered for tracking and trending purposes and assignment of corrective actions.

b. Conclusion

No findings of significance were identified.

3. Permanent Plant Modifications (IP 88135)

a. Inspection Scope and Observations

The inspectors reviewed records and documentation associated with a design modification (ECR-2030583) to install nitrogen oxide (NO_x) detectors in the vicinity of column dissolvers located in Building 333. The inspectors noted that the detection system was identical to existing onsite NO_x detection systems. The inspectors verified that operational details associated with the new detection system had been incorporated into appropriate operating procedures. The inspectors performed field observations with licensee personnel to verify that the as built configuration was in accordance with design documents. The inspectors noted that the system was operational and that control panels displayed current system status. The three NO_x detectors were installed in locations to provide early warning of the presence of NO_x gases and local and remote alarm sensors were observed to be operable and clearly visible to personnel. Licensee personnel demonstrated the operational features of the system control panel and were knowledgeable of the alarm settings and function of the system. The inspectors verified that training had been provided to operators concerning the purpose and function of the system and operator response actions to take in the event of an alarm.

b. Conclusion

No findings of significance were identified.

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

a. Inspection Scope and Observations

The inspectors reviewed the licensee's CAP to ensure that items adverse to safety were being identified and tracked to closure. The inspectors also performed frequent 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. Furthermore, 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 their CAP. For this reporting period, inspectors reviewed the licensee's lockout/tagout program audit and their safety culture third-party assessment.

b. Conclusion

No findings of significance were identified.

D. Other Areas

1. Follow-up on Previously Identified Issues

a. Decommissioning Planning Rule (DPR) Inspection Activity per NRC Inspection Manual Temporary Instruction 2600/017, dated February 25, 2013

Based on the results of the environmental inspection documented in Section B.3, the inspectors verified that the licensee maintained adequate radiological control programs to minimize the introduction of radiological contamination into the site environment, and had a program to ensure that releases of radioactivity to the environment are promptly identified and characterized. In addition, the inspectors verified that the licensee recorded radiological survey data to identify the location and concentrations or quantities of contamination that may require remediation at the time of license termination, and was reporting updated financial assurance as required by the DPR.

b. Conclusion

The licensee adequately maintained radiological programs that minimized radiological site contamination and remediation, ensured prompt identification, characterization and documentation of radioactive environmental releases, and maintained the required financial assurance documentation in accordance with the Decommissioning Planning Rule.

E. Exit Meeting

The inspection scope and results were presented to members of the licensee's staff at various meetings throughout the inspection period and on October 10, 2013, to J. Henry and his staff. No dissenting comments were received from the licensee. Proprietary information was discussed but not included in the report.

SUPPLEMENTARY INFORMATION

1. KEY POINTS OF CONTACT

Name	Title
S. Barron	Emergency Preparedness Manager
C. Brown	MC&A Department Section Manager
T. Coates	Senior Advisory Engineering Section Manager
B. Cooper	Industrial Safety Unit Manager
R. Dailey	Engineering Director
M. Dotson	Work Management Section Manager
R. Droke	Senior Regulatory Advisor
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N. Kenner	Safety Culture Improvement Section Manager
M. McKinnon	Operations Section Manager
M. Moore	Environmental Protection & Industrial Safety Section Manager
C. Morie	Decommissioning Environmental Unit Manager
J. Nagy	Nuclear Safety Officer Chief
L. Sanders	Corrective Action Program Manager
R. Shackelford	Nuclear Safety & Licensing Section Manager
M. Tester	Radiation Protection Unit Manager
K. Weir	Security Section Manager
J. Wheeler	Project Engineering Section Manager

2. LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

None

3. INSPECTION PROCEDURES USED

88020	Operational Safety
88045	Effluent Control and Environmental Protection
88050	Emergency Preparedness
88070	Permanent Plant Modifications
88135	Resident Inspection Program For Category I Fuel Cycle Facilities
TI 2600/017	Decommissioning Planning Rule, February 25, 2013

4. DOCUMENTS REVIEWED

Procedures:

NFS-CM-004, NFS Change Control Process, Rev. 12
NFS-HS-A-67, Documenting the Safety and Regulatory Review of Facility Changes, Rev. 9
NFS-GH-901, Configuration Management Program, Rev. 17
NFS-GH-44, Evaluation and Implementation of Internally Authorized Changes, Rev. 13
SOP 409, Section 71, 301 Receipt Calciner, Rev. 12
NFS-HS-B-40, Inspecting Emergency Equipment and Supplies, Rev. 25

NFS-HS-E-03, Emergency Response Organization, Rev. 24
NFS-HS-E-07, On-site Radiological Emergency Assessment, Rev. 27
NFS-HS-E-08, Off-site Radiological Assessment, Rev. 23
NFS-HS-E-09, Off-site Dose Projection for Radiological Emergency, Rev. 23
NFS-GH-43, Safety Related Equipment Control Program, Rev. 22
NFS-EC-1, Calibration of Weight or Mass Measuring Systems, Rev. 10
NFS-EC-5, Calibration of Pressure Instruments, Rev. 4
SOP 401, Section 8, Area 800, Rev. 21
NFS-HS-A-86, Operation of the Process Discard In-Line Monitoring, Rev. 2
NFS-HS-B-95, Testing/Inspection of Fire Barrier Systems, Rev. 2
NFS-GH-903, Emergency Plan, Rev. 17
Emergency Plan Letter of Agreements:
Erwin Fire Department, dated December 16, 2010
South Unicoi Volunteer Fire Department, dated January 26, 2011
Town of Erwin, dated January 25, 2010
Medic One Emergency Medical Services, dated April 7, 2011
Unicoi County Memorial Hospital, dated December 23, 2010
Johnson City Medical Center Hospital, dated January 6, 2011
Radiation Emergency Assistance Center/Training Support (REAC/TS), dated February 11, 2010
Procedure IROFS 333-UOXIDE, Revision 0 (Annual surveillance test of NO_x detectors)
SOP 409-1, General Requirements for BLEU Preparation & Associated Facilities, Rev. 38
21T-09-0632, Technical Basis: Dose Factors and Action Levels for WWTF Radioactive Liquid Effluents, Rev. 2
NFS-GH-909, Environmental Protection Program, Rev. 7
Determining the Need for an NRC-Approved Decommissioning Plan for Dismantling the BLUE Complex Facilities, 21T-13-002, Rev. 5
Special Nuclear Material License SNM-124, Decommissioning Sections 1.2.5.5, Section 10.5, Rev. 1 and 2
21G-13-0035, Biannual Effluent Monitoring Report July through December 2012
21G-12-0167, Biannual Effluent Monitoring Report January through June 2012
NFS-HS-A-54, Effluent Control and Environmental Monitoring Action Levels and Minimum Detectable Concentration Requirements, Rev. 9
NFS-HS-B-16, Routine Sampling of Sanitary Sewer and Groundwater Treatment Facility Effluent, Rev. 29
NFS-HS-B-41, Groundwater Monitoring, Rev. 24
NFS-HS-B-73, Analysis of Environmental Liquid and Environmental Air Samples, Rev. 8
SOP-401-06-302, Building 302

Records:
ECR-20120440, Upgrades to 301 Receipt (RFS) Calciner, April 4, 2012
ECR-20121426 and ECR-20130061, Install SRE Level Control System for U-Oxide Dissolver System in 333
ECR-20120995, Equivalency for Ball Valve, dated August 14, 2012
ECR-20120614, Removal of Process Water Valves and Replacement of Piping, dated May 15, 2012
ECR-20120317, Replace Toggle Valve with Bellows Toggle Valve, dated March 12, 2012
ECR 20121284, Equivalency for Baldor AC Controller. October 13, 2012
ECR 20120003, Install Relief Valve on Bowl Cleaning Station, dated January 2, 2012

ECR-20121259, Replacement of Spring Return Valve and Establish Equivalency, dated October 8, 2012
ECR-20120177, Process Water Lines Changes to Deionized Water, dated February 20, 2012
ECR-20121547, Installation of Individual Water Isolation Valves, dated December 17, 2012
ECR-20121147, Addition of Isolation Valves, dated September 7, 2012
WR 200458, Modifications and SRE Testing
WR 0000148566, Install Level Switches
Fourth Quarter 2012 ISA Risk Assessment Audit-ISA Recovery Summary, Table 4-13 Chemical Safety Risk Analysis Summary (Occupational)
21T-12-0771, HEA-21, Chemical Analysis Methodology and Calculations for Fires, Rev. 0
Emergency Plan Submittal and Record of Revisions for Revision 17, dated October 29, 2012
Safety and Safeguards Review Council (SSRC) Minutes, dated September 27, 2012
SSRC Minutes, dated October 25, 2012
Quality Assurance Audit QA-12-22, Emergency Preparedness, dated December 17, 2012
NFS Emergency Personnel Call List
Quarterly Emergency Call List Communications Tests, January through June, 2013
Training Records for ERO Members and Current Training Delinquency Report, July 2013
Off-site Agencies Training Materials and Documentation, 2012-2013
NFS Annual Criticality Alarm Evacuation Drill Reports, 2012
Meteorological Monitoring Current Calibration Records
Monthly and Quarterly Emergency Equipment and Facility Inspection Checklists, January through June, 2013
Report for Nitric Acid Spill into Dike Due to Installation of Incompatible Flow Meter, dated January 9, 2012
Manufacturing Specifications for Welch DuoSeal Vacuum Pump
NFS-HS-B-95, Att. B Annual Fire Wall/Fire Barrier Inspection, Revs. 1 and 2
Functional Test N306MONITR4WD01 Monthly Calibration
Change Authorization ECR-2030583, Install Fixed NOx Detection at Bldg. 333 Column Dissolvers
Work Request #213026, Install Fixed NOx Detection at Bldg. 333 Column Dissolvers
TP-JA0342-001, Installation Qualification Test Plan, Rev. 0, Fixed NOx Detection at Bldg. 333 Column Dissolvers
TP-JA0342-002, Operation Qualification Test Plan, Rev. 0, Fixed NOx Detection at Bldg. 333 Column Dissolvers
Calibration Record NOX Detector, dated August 3, 2013, for NOx Detectors AE-3X18A, B, and C
BLEU Project Bldg. 333 Column Dissolvers NOx Detection, SRE Control System Functional Design Specification, Rev. 0, Document FDS-N333XNOXDET3X18
Toolbox Training, OPR-TB-JUN13-03, Fixed NOx Detection for 333 U-Oxide Column Dissolvers
Functional Test N306XFRDAMP0002
Functional Test N306XFRDAMP0004
NFS-HS-A-86, Discard ILMS Calibration Data, Rev. 2
SRE Functional Test N306XFILTERX811
SRE Functional Test N306XFILTERX812
Training Qualifications for various operators
ENG-SWI-08-16, Combustible Gas Detector Calibration Work Instructions
SRE Functional Test Records for Combustible Gas Detectors
Safety Department Monthly Inspection/Quarterly Audits, samples from 2012 and 2013.

USGS Water Data Report 2012, 03465500, Nolichucky River at Embreeville, TN
121126-TNNFS-RRT-398, ARCADIS Report, North Site and Well 98A Investigation Report
56T-11-0052, Environmental Safety – Quality Assurance Audit QA-11-16, Rev. 0
21T-12-0847, 2012 Environmental Safety Triennial Independent Audit, Rev. 0
SAF-035, Monthly Inspection/Quarterly Audit, May 2013, Rev. 0
Decommissioning Funding Plan, dated November 30, 2012
21G-13-0088, Response to RAI Concerning Updated Decommissioning Funding Plan, dated April 17, 2013
21G-12-0245, Update Decommissioning Funding Plan as Required by 10 CFR Part 70.25 (e)(2), dated November 30, 2012
USNRC letter to NFS, Nuclear Fuel Services, INC. Interim Approval of Decommissioning Cost Estimate Amount (TAC L33250), dated June 11, 2013
Decommissioning Cost Estimate, dated November 30, 2013
ARCADIS Investigation Report, North Site and [groundwater sample] Well 98A Investigation Report, 2013
WR 206650, Replace 302-600 cooling chamber
WR 207950, Adjust storage chamber pusher
21X-13-0001, ISA Review, 300 Complex Production Areas 100-to-900 Integrated Safety Analysis Summary, Rev. 9
Conduct of Operations Att. IV, 302 Area 600 Combustible Gas Event
SWP 15328, Install fire retardant plastic to furnace boot
Building 302 H&S Contamination Report, dated July 18, 2013
Nasal and Saliva Survey Reports dated, dated July 17, 2013

P&IDs:
306-F0046-D; Tank XX-WD01 and Tank XX-WD02
306-F0016-D; Area 800 sheet 4
306-F0015-D; Area 800 sheet 3
307-F0304-D; Area 800 sheet 11
1-7523-0002, General Assembly and Outline, Elevator, dated February 7, 1983
97150-93-520, Exit Cross Pusher Stand Assembly
97150-93-500, Exit Cross Pusher Assembly
97150-94-520-M, Exit Cross Transfer Stand Assembly
97150-101-500-M, Exit Registration

Problem Identification Resolution and Correction System (PIRCS) Entries and Corrective Action Reports:
CA 18901, ISA Summary Table 4-13 Revs, dated November 19, 2012
PIRCS #39530, Emergency Preparedness Critique, 2013 Biennial Full Scale NRC Graded Exercise
PIRCS 33228, Nitric Acid Event Summary of Critique Action Items, dated February 9, 2012
PIRCS 39926, Criticality Detector Ambient Temperature Control, dated June 13, 2013
PIRCS 38027, Criticality Detector Placement during Maintenance Work in Area
PIRCS 38860, Criticality Detector Failure, dated March 26, 2013
PIRCS 36091, NRC EP Inspection Items for Correction,
PIRCS 18319, Emergency Preparedness 2011 Audit, dated August 29, 2012
PIRCS 36673, NFS sewer sample results
PIRCS 35712, North Site remediation area well # 98A, 2012 sample results
PIRCS 35190, Wastewater pipeline leak led to WWTF contamination
PIRCS 40830, Area 600 vessel question
PIRCS 40403, 302-600 fire

PIRCS 40399, Power interruption and mis-sequence
PIRCS 40531, 302-600 repairs