



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION II  
SAM NUNN ATLANTA FEDERAL CENTER  
61 FORSYTH STREET, SW, SUITE 23T85  
ATLANTA, GEORGIA 30303-8931

October 30, 2008

NMED Nos. 080056, 080389, 080390  
EN Nos. 43937, 44417, 44435, 44344, 44345, 44532

Mr. Dwight Ferguson  
President  
Nuclear Fuel Services, Inc.  
P. O. Box 337, MS 123  
Erwin, TN 37650

SUBJECT: NRC INSPECTION REPORT NO. 70-143/2008-003 AND NOTICE OF VIOLATION

Dear Mr. Ferguson:

This letter refers to the inspection conducted from July 6, 2008 to October 4, 2008, at the Nuclear Fuel Services (NFS) facility in Erwin, TN. The purpose of the inspection was to determine whether activities authorized under the license were conducted safely and in accordance with NRC requirements. At the conclusion of the inspection, the findings were discussed on October 9, 2008, with those members of your staff identified in the enclosed report.

The inspection consisted of an examination of activities conducted under the license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of the license. Areas examined during the inspection are identified in the enclosed report. Within these areas, the inspection consisted of a selective examination of procedures and representative records, observations of activities in progress, and interviews with personnel.

Based on the results of these 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 included on the NRC's Web site at <http://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 it is described in the subject inspection report. The violation is being cited in the Notice because it was identified by the NRC.

You are required to respond to this letter and should follow the instructions specified in the enclosed notice when preparing your response. The guidance from NRC Information Notice 96-28, "Suggested Guidance Relating to Development and Implementation of Corrective Action," is available on the NRC's Web Site and may be helpful. The NRC will use your response, in part, to determine whether further enforcement action is necessary to ensure compliance with regulatory requirements.

In addition to the violation discussed above, a violation was also identified and treated as a Non-Cited Violation (NCV), consistent with Section VI.A of the Enforcement Policy. The NCV is described in the subject inspection report. If you contest these violations or their significance, 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, and (3) the NRC Senior Resident Inspector at your facility.

We received your reply to our Notice of Violation 70-143/2008-002-01, (letter, dated September 3, 2008). This reply met the requirements of 10 CFR 2.201 and your corrective actions will be reviewed during a future inspection.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosures, and your response 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>. To the extent possible, your response should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the Public without redaction.

Should you have any questions concerning this inspection, please contact us.

Sincerely,

***/RA/ J. Henson for***

D. Charles. Payne, Chief  
Fuel Facility Inspection Branch 1  
Division of Fuel Facility Inspection

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

Enclosures: 1. Notice of Violation  
2. NRC Inspection Report No. 70-143/2008-003

cc w/encls:  
Timothy Lindstrom  
General Manager  
Nuclear Fuel Services, Inc.  
Electronic Mail Distribution

B. Marie Moore  
Vice President  
Safety and Regulatory Management  
Nuclear Fuel Services, Inc.  
Electronic Mail Distribution

(cc w/encls: Cont'd on page 3)

D. Ferguson, Jr.

3

(cc w/encls: cont'd)  
Lawrence E. Nanney  
Director  
TN Dept. of Environment & Conservation  
Electronic Mail Distribution

William D. Lewis  
Mayor  
Town of Erwin  
211 N. Main Avenue  
P. O. Box 59  
Erwin, TN 37650

Gregg Lynch  
Mayor  
Unicoi County  
P. O. Box 169  
Erwin, TN 37650

Johnny Lynch  
Mayor  
Town of Unicoi  
Unicoi, TN 37692

Linda Modica  
266 Mayberry Road  
Jonesborough, TN 37659

Distribution w/encls: (See page 4)

Distribution w/encls:

C. Evans, RII  
 OE Mail  
 PUBLIC  
 S. Burris, RII  
 M. Tschlitz, NMSS  
 N. Baker, NMSS  
 P. Habighorst, NMSS  
 C. Payne, RII  
 M. Crespo, RII  
 G. Smith, RII  
 K. Ramsey, NMSS  
 M. Ernstes, RII  
[nmed@inl.gov](mailto:nmed@inl.gov)

**\*see previous concurrence**

PUBLICLY AVAILABLE     NON-PUBLICLY AVAILABLE     SENSITIVE     NON-SENSITIVE

ADAMS:  Yes    ACCESSION NUMBER: \_\_\_\_\_     SUNSI REVIEW COMPLETE

OFFICE	RII:DFFI	RII:DFFI	RII:DFFI	RII:DFFI	RII:DFFI	RII:DFFI	RII:DFFI
SIGNATURE	SB 10/29/08	GS 10/29/08	MC for 10/27/08	MC for 10/27/08	RP 10/27/08	MC 10/27/08	ME 1-/28/08
NAME	SBurris*	GSmith*	OLopez*	AGooden*	RPrince*	MCrespo*	MErnstes*
DATE	10/ /2008	10/ /2008	10/ /2008	10/ /2008	10/ /2008	10/ /2008	10/ /2008
E-MAIL COPY?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO

## NOTICE OF VIOLATION

Nuclear Fuel Services, Inc.  
Erwin, Tennessee

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

During an NRC inspection conducted from August 25 - 29, 2008, a violation of NRC requirements was identified. In accordance with the NRC Enforcement Policy, the violation is listed below:

Safety Condition S-1 of Special Nuclear Materials (SNM) License No. SNM-124, authorizes the use of licensed materials in accordance with the statements, representations, and conditions in the License Application and Supplements.

Section 2.7 of the License Application states in part that SNM operations and safety function activities shall be conducted in accordance with approved written procedures.

Section 5.5 of NFS-GH-22 "Fire Door, Barrier and Damper Inspection and Maintenance", states that an annual fire damper inspection will be conducted during the last quarter of the year by Maintenance.

Contrary to the above, as of the 4<sup>th</sup> quarter of 2006, the licensee failed to perform an annual fire damper inspection during the last quarter of the year.

This is a Severity Level IV violation (Supplement VI).

Pursuant to the provisions of 10 CFR 2.201, Nuclear Fuel Services, Inc. is hereby required to submit a written statement or explanation to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, D.C. 20555 with a copy to the Regional Administrator, Region II, and a copy to the NRC Senior Resident Inspectors at the facility that is the subject of this Notice, within 30 days of the date of the letter transmitting this Notice of Violation (Notice). This reply should be clearly marked as a "Reply to a Notice of Violation" and should include for each violation: (1) the reason for the violation, or, if contested, the basis for disputing the violation or severity level, (2) the corrective steps that have been taken and the results achieved, (3) the corrective steps that will be taken to avoid further violations, and (4) the date when full compliance will be achieved. Your response may reference or include previously docketed correspondence, if the correspondence adequately addresses the required response. If an adequate reply is not received within the time specified in this Notice, an order or a Demand for Information may be issued as to why the license should not be modified, suspended, or revoked, or why such other action as may be proper should not be taken. Where good cause is shown, consideration will be given to extending the response time.

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

Because your response will be made publicly available, to the extent possible, it should not include any personal privacy, proprietary, or safeguards information so that it can be made publicly available without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that

identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request withholding of such material, you must specifically identify the portions of your response that you seek to have withheld, and provide in detail the basis for your claim of withholding (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.390(b) to support a request for withholding confidential commercial or financial information). If safeguards information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21.

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

Dated this 30<sup>th</sup> day of October, 2008.

U. S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.: 70-143

License No.: SNM-124

Report No.: 70-143/2008-003

Licensee: Nuclear Fuel Services, Inc.

Facility: Erwin Facility

Location: Erwin, TN 37650

Dates: July 06, 2008 – October 04, 2008

Inspectors: S. Burris, Senior Resident Inspector  
G. Smith, Resident Inspector  
R. Prince, Fuel Facility Inspector  
M. Crespo, Senior Fuel Facility Inspector  
A. Gooden, Senior Fuel Facility Inspector  
O. Lopez, Fuel Facility Inspector  
G. Woodruff, Fuel Facility Inspector (In-training)

Approved by: D. Charles Payne, Chief  
Fuel Facility Inspection Branch 1  
Division of Fuel Facility Inspection

## **EXECUTIVE SUMMARY**

Nuclear Fuel Services, Inc.  
NRC Inspection Report 70-143/2008-003

This inspection included activities conducted by the resident and regional inspectors during normal and off normal shifts in the areas of safety operations, radiological controls, facility support, and safeguards.

### **Safety Operations**

- Plant operations activities were performed safely and in accordance with approved procedures. A non-cited violation was identified for the failure to adhere to a stop work order. (Paragraph 2.a)
- Criticality station limit cards were followed by licensee personnel. (Paragraph 2.b)
- Fire detection and suppression systems, including Items Relied on for Safety (IROFS), were properly maintained. The process areas were operated in accordance with fire safety requirements. The pre-fire plan was accurate. A violation was identified for the failure to inspect fire dampers as required by procedure NFS-GH-22. An unresolved item was identified to evaluate deficiencies associated with Building 310 Warehouse ISA and management measures for IROFS FIRE-2. (Paragraph 2.c)

### **Radiological Controls**

- Radiation protection surveillance activities, instrument operation and calibration, and as low as reasonably achievable (ALARA) program activities were properly maintained. Personnel dose assessment associated with a contamination event was properly assessed, and corrective actions were identified and tracked in accordance with approved procedures. Radiological safety-related issues were identified and addressed in accordance with the licensee's corrective action program. (Paragraph 3.a)
- All effluent discharges were well below applicable regulatory and license limits. (Paragraph 3.b)

### **Facility Support**

- Emergency preparedness program changes made since the last inspection did not reduce the effectiveness of the program. The revised emergency procedures continued to implement the Emergency Plan and key emergency response personnel were trained in accordance with the Plan. The site Emergency Preparedness Coordinator maintains frequent contact with offsite support organizations on matters involving emergency preparedness. Additionally, the emergency response equipment, instrumentation, and supplies were maintained in sufficient quantities and a state of operational readiness. (Paragraph 4.a)

- The inspectors determined that the licensee adequately implemented their Problem Identification and Resolution Correction System (PIRCS) program (Paragraph 4.b)

**Safeguards**

- Physical Protection elements were carried out in accordance with the security plan (Paragraph 5)

**Attachment:**

Partial List of Persons Contacted

Inspection Procedures Used

List of Items Opened, Closed, and Discussed

## **REPORT DETAILS**

### **1. Summary of Plant Status**

Fuel manufacturing, training activities, and scrap recovery processes were operated throughout the reporting period. Blended low enriched uranium (BLEU) oxide conversion activities operated normally during the inspection period. BLEU Preparation Facility (BPF) operations were conducted in accordance with license requirements. Decommissioning, including processing, sampling, packaging, and shipping contaminated soil and debris from burial grounds continue under normal operations.

### **2. Safety Operations**

#### **a. Plant Operations (Inspection Procedure (IP) 88135 and 88020)**

#### **(1) Inspection Scope and Observations**

##### **Operating Area Observations**

The inspectors performed daily tours of the plant operating areas and determined that equipment and systems were operated safely and in compliance with the license. Daily operational meetings were observed throughout the period where production status and issues were discussed. The inspectors reviewed selected licensee identified events and corrective actions for previously identified events and found no significant deficiencies in the items reviewed. The inspectors focused on plant operations, safety related equipment (valves, sensors, instrumentation, in-line monitors, scales, etc) and items relied on for safety (IROFS)

These daily tours included walkdowns of the BPF, Naval fuel process areas, storage areas, vaults, and the waste treatment facility. The inspectors verified that there was adequate staffing and that operators were attentive to their duties, including the status of various alarms and annunciators. The inspectors also verified that activities, normal and abnormal, were performed in compliance with procedures and station limits, and that safety controls were in place and were being controlled with supervision. The inspectors verified the adequacy of communications between supervisors and operators within the operating areas. The inspectors walked down sections of the standard operating procedures and verified that IROFS were identified and operable in each of the areas. The inspectors reviewed log books, lockout/tag out records, and Letters of Authorization (i.e. temporary modifications) to obtain information concerning operating trends and activities. The inspectors verified the licensee was actively pursuing corrective action for conditions requiring temporary modifications as well as any prescribed compensatory measures.

The inspectors evaluated an issue in Area 800 that dealt with the failure to reinstall a pre-filter in a glovebox following a change in processed material. This pre-filter is not credited as an IROFS in the ISA. This non-compliance was entered into the corrective action system as PIRCS #15249. This licensee-identified failure constitutes a violation of minor significance and is not subject to formal enforcement action.

The inspectors reviewed actions with regard to the corrective action system. The inspectors noted an issue involving a remote pump that seemed to leave the lines pressurized even when the pump was shut off. Operators had entered the issue into the corrective action system, but the issue had not yet been resolved. The residents will continue to review the licensee's response to this item.

On August 14, 2008, a plant operator was observed operating the shear device within building 333 during a stop movement order. The stop movement order was in effect while troubleshooting was performed on a pair of criticality detectors. This non-compliance was discovered by a plant engineering supervisor who was following the criticality detector work. The shearing activity was immediately suspended and management was notified. The licensee entered the issue into the Problem Identification, Resolution, and Correction System (PIRCS) as item #14817. The failure to comply with the stop movement was a violation of NRC requirements. This non-repetitive, licensee-identified and corrected violation is being treated as a non-cited violation (NCV), consistent with Section VI.A.8 of the NRC Enforcement Policy (NCV 70-143/2008-003-01).

#### Plant Tours

The inspectors performed periodic tours of the out-lying facility areas during the inspection period and determined that equipment and systems were operated safely and in compliance with the license. The focus of these tours centered around the evaluation of potential missile hazards and missile protection features, combustible material storage and fire loading, hazardous chemical storage, adequate storage of compressed gas containers, potential degradation of plant security features, and potential fire hazards. Additionally during plant tours, the inspectors verified that all required notices to workers were appropriately posted as required by 10 CFR 19.11.

#### Plan-of-the-Day-Meeting.

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 the licensee's approach to solving various plant problems.

#### Safety-Significant System Walk down

During the inspection period, the inspectors performed a walkdown of the below listed safety significant systems involved with the processing of special nuclear material (SNM). As part of this system evaluation, the inspectors reviewed the Integrated Safety Assessment (ISA) for the system in order to identify assumptions and controls. The inspectors verified that these assumptions and controls were properly implemented in the field. During the walkdown, the inspectors verified that the as-built configuration matched the approved plant drawings. The inspectors also interviewed operators in order to ensure that plant personnel were familiar with the assumptions and controls associated with these systems as well as the IROFS and IROFS instrumentation for maintaining plant safety. Specifically, the inspectors verified correct valve and switch

position alignments as required by procedure, the absence of conditions that may degrade plant performance as well as the operability of IROFS, safety-related devices, and support systems essential to safety system performance:

- Building 440 system
- BPF Down blending System

(2) Conclusions

The licensee operated the facility safely and in accordance with the license requirements and the ISA. The inspectors did note one NCV associated with movement of SNM.

b. Criticality Safety (IP 88135)

(1) Inspection Scope and Observations

During daily operating area tours, the inspectors verified various criticality controls to be in place. The station limit card requirements were observed by personnel. Containers were adequately controlled in order to minimize criticality hazards. The inspectors sampled a number of criticality-related IROFS to verify their operability. Operators were knowledgeable of the IROFS requirements. These IROFS were adequately identified in the field as well as on plant controlled drawings.

(2) Conclusions

Licensee criticality controls were adequately followed by licensee personnel. No violations of NRC requirements were identified

c. Fire Protection (IP 88135 and IP 88055)

Routine Plant Tours (IP 88135)

(1) Inspection Scope and Observations

During the inspection period, the inspectors conducted a fire safety tour of building 302. The inspectors verified adequate control of combustible material. The inspectors walked down various fire suppression components and systems that supplied building 302 and verified these systems were operational. The inspectors verified that various aspects of the fire protection/prevention strategies conformed to the applicable nuclear criticality safety evaluation.

On July 21, 2008, the inspectors evaluated the fire brigade's performance in response to an actual fire associated with an oxygen cylinder located outside near building 105. The inspectors verified turnout gear was properly donned and self-contained breathing apparatus equipment was properly worn. The brigade members positioned and pressurized fire hoses and ultimately extinguished the fire with water. The area was properly controlled and the brigade leader displayed clear, thorough, and effective

direction to the brigade members. The inspectors verified adequate plant communications during the event. Finally, the inspectors noted that the pre-plan fire fighting strategies were followed.

(2) Conclusions

During routine plant tours the inspectors verified that fire protection associated with building 302 exhibited an adequate defense in depth. Additionally, the fire brigade demonstrated adequate capabilities to fight a fire within the facility. No violations of NRC requirements were identified.

Program Implementation (02.01) (IP88055)

Identification and Resolution of Problems (02.03) (IP 88055)

(1) Scope and Observations

The inspectors toured areas protected by fire detection systems as specified in the ISA and verified that they were in operable condition. The inspectors also reviewed surveillance tests and verified they were performed in accordance with license requirements. The inspectors toured process areas to verify that the licensee was controlling combustibles and flammable materials in accordance with their procedures. The inspectors noted that operating areas were in compliance with fire safety requirements. The inspectors reviewed the pre-fire plans for the fuel process and uranium recovery. No safety problems were identified.

The inspectors walked down water-based and carbon dioxide fire suppression systems, as well as manual fire fighting equipment. The inspectors also reviewed surveillance records for the fire suppression systems. The inspectors confirmed that nozzles were not obstructed, that water and carbon dioxide supplies to the systems were readily available with correct valve positioning and adequate pressure; and that there was no observable physical degradation of the systems. The inspectors also verified that portable fire extinguishers were readily available and rated for the correct fire scenario.

The inspectors walked down fire barrier systems and verified that they were in good condition without cracks, gouges, or holes/gaps. The inspectors also verified that penetrations in fire-rated walls were properly sealed. The inspectors reviewed inspection, testing, and maintenance records for fire barriers systems. The inspectors noted that the licensee had not inspected the fire dampers for the past two years, including fire dampers designated as IROFS. The inspectors noted that fire dampers designated as IROFS were not part of the safety related equipment list nor were the fire damper inspections formally integrated into the fire protection program. Section 5.5 of NFS-GH-22 "Fire Door, Barrier and Damper Inspection and Maintenance," states, in part, that an annual fire damper inspection will be conducted during the last quarter of the year by Maintenance. Failure to inspect fire dampers as required by procedure NFS-GH-22 is a violation of NRC requirements (VIO 70-143/2008-003-02).

The inspectors reviewed the ISA and the fire hazard analysis (FHA) for Building 300 A/B Warehouse and Building 310 Warehouse. For Building 300 A/B Warehouse, the

licensee identified a dry pipe sprinkler system as the only fire-related IROFS. The FHA stated that the combustible loading in the warehouse had increased in the recent past and the installed sprinkler system was not adequate to protect the structure and the actual contents. The inspectors determined the safety significance of this issue to be low because this warehouse had not handled SNM in one year and is limited to a small quantity of SNM. The licensee stated that they will upgrade the sprinkler system to ensure they have adequate protection and a two hour fire-rated wall will be installed to separate the south bay from middle and north bays.

During the review of the ISA for Building 310 Warehouse, the inspectors determined that the only identified IROFS was inadequate for meeting 10 CFR 70.61(b) requirements for the identified high consequence event. 10 CFR 70.61(b) requires high consequence events (i.e. potentially life-threatening events) to have a very low likelihood of occurring. The required very low likelihood is defined for NFS (in their ISA) as an event with a likelihood index of less than or equal to -4 (which translates to 1 in every 10,000 years). Building 310 Warehouse is a large storage warehouse for hazardous and non-hazardous nuclear materials. The licensee determined that a fire in the warehouse could result in a high consequence event due to a chemical release. Therefore, the licensee needed to identify and establish IROFS to reduce the likelihood index of the event down to an index of -4. Based on the NFS ISA, an administrative IROFS would reduce the likelihood index by -1. The fire hazard analysis for the 310 warehouse assigned an index of -2 to the initiating event (a large fire would occur every 100 years). The NFS ISA methodology states that the event likelihood is obtained by summing the indexes of the initiating event and the assigned IROFS. The licensee only identified a single administrative IROFS to reduce the likelihood. This one administrative control's index number (-1), when summed with the likelihood index of the initiating event (-2), results in a likelihood index of -3, which is insufficient to meet the performance requirements.

The one administrative IROFS was the monthly surveillances of the Combustible Control Program, IROFS FIRE-2, which monitors combustible loading in areas to ensure fuel for a fire is not present in sufficient quantities. This sole IROFS fails to meet the performance requirements of 70.61(b) since it does not reduce the likelihood index to -4.

In addition, the inspectors noted that the monthly surveillance in the Building 310 Warehouse had been identifying non-compliances with the Combustible Control Program since July 2008. However, the licensee had not taken effective corrective actions to address the issues. Based on these findings, the inspectors determined that the management measures in place for IROFS FIRE-2 were not ensuring the reliability of the control to prevent a fire. The licensee failed to implement management measures (such as effective corrective actions) to ensure the reliability of the IROFS.

The failure to meet the performance requirements of 10 CFR 70.61(b) and the failure to have adequate management measures to ensure the effectiveness of IROFS FIRE-2 are being evaluated for enforcement and will be tracked as an unresolved item (URI 70-143/2008-03-03). As an immediate corrective action, the licensee instituted a 2-hr fire watch and reduced the combustible loading in the warehouse.

(2) Conclusions

Fire detection and suppression systems, including IROFS, were maintained properly. The process areas were operated in accordance with fire safety requirements. The pre-fire plan was accurate. An unresolved item was identified to evaluate deficiencies identified with Building 310 Warehouse ISA and management measures for IROFS FIRE-2. A violation was identified for the failure to inspect fire dampers as required by procedure NFS-GH-22.

**3. Radiological Controls**

a. Radiation Protection (IP 88135 and IP 88030)

(1) Inspection Scope and Observations

Operating Area Observations (IP88135)

During various tours of the operating areas, the inspectors verified workers complied with health physics procedures. The inspectors noted that plant workers properly wore dosimetry, used protective clothing in accordance with applicable Radiological Work Permits (RWP), and properly frisked upon exiting the controlled area. The inspectors verified radiation areas were properly posted and that radiation maps included up-to-date radiation levels. The inspectors also verified the operation of radiation protection instruments as well as their calibration frequencies.

RWP Review (IP 88135)

The inspectors performed a detailed review of Safety Work Permit (SWP) #12533. This SWP included radiological requirements detailed under the RWP section as well as industrial safety requirements, due to work performed under a confined space permit 885. The work involved the cleaning and inspection of a uranyl nitrate tanker/trailer. The inspectors verified that craft personnel complied with the prescribed controls and precautions. The inspectors noted that the RWP contained adequate requirements concerning the radiation levels, respiratory equipment, dosimetry, contamination levels, special tools and equipment, airborne radioactivity, and containment devices. The area was effectively controlled by health physics personnel. The SWP was prominently posted for employees' review and observation. Workers entering the SWP area signed the SWP, verifying their knowledge of the entry requirements.

(2) Conclusions

The licensee properly implemented the safety work permit program.

Radiation Protection Program (R1.01), Instruments and Equipment (R1.03), Exposure Controls (R1.04), Postings, Labeling, Control (1.05), Surveys (R1.06), Notifications and Reports (R1.07), As Low As Is Reasonably Achievable (R1.08), and Follow up on Previously Identified Issues (R1.09) (IP 88030)

(1) Inspection Scope and Observations

The inspectors observed Radiation Control technicians performing routine surveys in controlled areas of the facility. Radiation Control technicians demonstrated adequate contamination survey and air sample filter change out techniques. Breathing zone air monitoring stations were positioned at appropriate locations to obtain representative air samples in work areas normally occupied by operators. The inspectors reviewed selected survey results for accuracy and completeness. No issues or concerns were identified.

The inspectors observed the performance of daily source response and operational checks of radiation monitoring equipment, and functional alarm verification of contamination monitors located at exit points from controlled areas. Licensee personnel were knowledgeable of the operational check requirements and performed activities in accordance with approved procedures.

The inspectors reviewed records associated with the calibration of portable survey instruments and hand-and-foot contamination monitors. The inspectors reviewed calibration sources for appropriate configuration and to confirm suitability of sources for their intended function. The inspectors found that personnel responsible for calibration were knowledgeable of associated procedural requirements. The inspectors reviewed selected calibration records for accuracy and completeness. No issues or concerns were identified.

The inspectors interviewed personnel responsible for the implementation of the ALARA program and the trending and tracking of personnel exposures. The inspectors noted that the Safety and Safeguards Review Committee (SSRC) serves as the ALARA committee, and SSRC meetings are held on a routine basis. The SSRC committee meeting agendas included a review of personnel exposures and contamination control issues. The inspectors noted that radiological safety-related trending data presented to the SSRC for review and evaluation was comprehensive and presented in a manner that facilitated the identification of any adverse trends.

The inspectors reviewed the licensee's corrective action program pertaining to issues involving radiological safety matters. The threshold for radiological safety-related problem identification was adequate and corrective actions implemented in accordance with the licensee's corrective action program.

The inspectors reviewed corrective actions and the radiological dose assessment associated with a personnel contamination event that occurred on August 18, 2008. The licensee's investigation traced the source of the contamination to an evolution conducted on the evening of August 15, 2008. The inspectors discussed the licensee's response to the incident with cognizant personnel and reviewed supporting radiological survey

documentation. The inspectors observed the location of the source of the contamination and inspected air sample points that were utilized for calculating exposures to individuals who were in the effected area when elevated airborne activity levels were present. The inspectors found that the licensee's response and assessment of worker exposures was adequate and noted that personnel exposures did not exceed established administrative exposure guidelines and were well below regulatory exposure limits.

(2) Conclusions

Radiation Protection surveillance activities, instrument operation and calibration, and as low as reasonably achievable (ALARA) program activities were properly maintained. Radiation Protection equipment is adequately maintained and available for use. Personnel dose assessment associated with a contamination event was properly assessed and corrective actions identified and tracked in accordance with approved procedures. Radiological safety-related issues are identified and addressed in accordance with the licensee's corrective action program.

b. Environmental Protection (IP 88135)

(1) Inspection Scope and Observations

The inspectors performed a review of the Semi-annual radioactive effluents release report dated August 28, 2008. This report covered the period from January to June 2008. No issues were noted.

(2) Conclusions

The licensee submitted a biannual effluent monitoring report for the first half of 2008 as required by 10 CFR 70.59. All effluents were well below applicable regulatory and license limits. No violations of NRC requirements were identified.

**4. Facility Support**

a. Emergency Preparedness (88050)

Review of Program Changes (F3.01)

(1) Inspection Scope and Observations

Changes to the Emergency Plan (EP), organization, facilities, and equipment were reviewed to assess the impact on the effectiveness of the program. The adequacy of the emergency preparedness audit required by Section 7.5 of the Plan was also evaluated. Since the last inspection (March 2007), changes were made to the EP, equipment, and the assignment of personnel to the emergency organization. The changes that were reviewed and discussed did not result in a negative impact on the state of emergency preparedness. The inspectors noted a significant change to the protective action guide exposure limit for emergency workers performing search and rescue. Previously, emergency personnel required approval from the Emergency Control Director (ECD) to

enter radiation areas greater than 20 milli-rem per hour (mr/hr). The EP and applicable implementing procedures were revised to require approval at 1000 mr/hr (one rem per hour). This change in the protective action exposure limit, although 50 times less conservative, is significantly less than the federal guidance in Table 2-2 of the Environmental Protection Agency Manual of Protective Action Guides and Protective Actions for Nuclear Incidents for emergency workers (25 rem total for lifesaving or protection of large populations). Changes incorporated as Revision 12 were considered as either Plan updates or improvement items. By letter dated July 15, 2008, NRC granted approval for changes incorporated as Revision 12 to the Plan.

The inspectors reviewed documentation from the annual independent audit performed by the quality assurance staff. Based on the review, the inspectors determined that the independent audit was adequate and met the requirements for such audit as described in Section 7.5 of the Plan.

(2) Conclusions

Based on documentation reviewed and interviews with members of the licensee's staff, program changes made since the last inspection did not reduce the effectiveness of the program. The independent audit met the Plan requirements for such audit. No violations of NRC requirements were identified.

Implementing Procedures (F3.02)

(1) Inspection Scope and Observations

Several implementing procedures revised since the last inspection were reviewed to determine the adequacy of revised procedures in the implementation of the EP. The inspectors noted that procedures were revised to reflect changes to the emergency organization, the protective action guide exposure limits for emergency workers, contamination control for emergency personnel, and emergency assessment during a criticality event. The reviewed changes did not result in a decrease in the effectiveness of the program or any inconsistencies between the Plan and implementing procedures.

(2) Conclusions

The revised emergency procedures continued to implement the Emergency Plan.

Training and Staffing of Emergency Organization (F3.03)

(1) Inspection Scope and Observations

Emergency response training was reviewed to determine if the licensee had provided training to key response personnel in accordance with Section 7.2 of the EP and various implementing procedures.

Key emergency response personnel (On-Scene Coordinators and ECD and alternates) were trained in accordance with Section 7.2 of the EP. The inspector conducted a walkthrough with an individual assigned to the emergency organization as an alternate

ECD. Simulated accident conditions were presented to the interviewee to evaluate their response to conditions as the ECD for decisions regarding EP activation and event classification. No problems were noted. The interviewee classified the event correctly and was familiar with the role and responsibilities as an alternate ECD. In addition to the ECD walkthrough, the inspector observed training which was provided to security personnel assigned as Emergency Control Center (ECC) Communicators during an emergency. Following the training, each trainee was requested to perform a communications test with an offsite agency listed on the emergency information form to reinforce the training. No problems were noted. All interviewees performed in a manner consistent with the EP and procedures requirements. Emergency response training documentation and interviews disclosed that training included both performance based training via tabletop drills, and instructions regarding changes to the EP and implementing procedures. The current emergency response organization staffing levels for responding to routine events appear to be adequate.

(2) Conclusions

Key emergency response personnel were trained in accordance with the Plan. The combination of drills and instructions pertaining to the Plan as well as procedure changes, provided an adequate level of training to maintain the proficiency of emergency personnel regarding response to postulated site accidents.

Offsite Support (F3.04)

(1) Inspection Scope and Observations

Licensee activities in the areas of training, agreements, and exercises were reviewed to determine if the licensee was periodically involving offsite support groups. Documentation and interviews disclosed that the licensee was contacting the offsite support groups for training, site tours, agreement updates, and participation in exercises. The inspectors observed joint training involving hands-on experience for members of the offsite support medical transport organization and members of the onsite fire brigade involving a simulated loading and off-loading of an injured victim from an incident scene to the offsite support medical transport vehicle. Based on the observations and comments by the participants, the inspectors concluded that the training was beneficial to all participants. The inspectors met with the City of Erwin Fire Department Chief to discuss the interface with the licensee on training, response to events, and periodic site tours and participation in drills. No issues were identified. The NFS Emergency Preparedness Coordinator frequently participated in meetings involving local and regional support agencies on matters of mutual interest involving emergency preparedness. Agreement letters with the offsite support agencies described in the Plan were current.

(2) Conclusions

The licensee properly involved offsite support groups.

b. Management Organization and Controls (IP 88135)

(1) Inspection Scope and Observations

The inspectors performed daily reviews of the licensee's PIRCS entries to ensure that items adverse to requirements and quality were being identified and tracked to closure. The inspectors verified that issues were being properly identified, reviewed and tracked to completion.

(2) Conclusions

The licensee sufficiently documented and corrected adverse conditions.

**5. Safeguards**

Physical Protection (IP 88135)

(1) Inspection Scope and Observations

During daily plant tours, the inspectors verified that persons within the protected area (PA) properly displayed photo identification and those individuals not possessing unescorted access clearance were properly escorted. During entry and exit from the PA, the inspectors verified that personnel were searched using appropriate search equipment. The inspectors verified attentiveness of security officers as well as the lines of communication between officers and supervision. Additionally during tours of the operating areas, the inspectors verified that the Material Access Area (MAA) portals were effectively controlled.

During a tour of the plant areas, the inspectors noted an uncleared person was not being properly escorted. This item will be tracked as an inspector followup item (IFI 70-143/2008-03-04) to verify the licensee's long term corrective actions. The situation was immediately corrected and entered into the PIRCS system as item #15248.

(2) Conclusions

NFS carried out security procedures that ensured the physical protection of the facility. No findings of significance were identified.

**6. Follow-up on Events (88135)**

The inspectors reviewed the actions involved in addressing NRC Event # 44344 (NMED No. 080389) and 44345 (NMED No. 080390) reported on July 11 and July 14, 2008, respectively. These event reports noted that the installed nitrogen oxide (NO<sub>x</sub>) detectors were determined to be in a degraded condition. Thus, these detectors were unable to alert individuals in the process area of a potential toxic atmosphere. The licensee made the notifications based on a lack of confidence in the last set of calibrations performed on the detectors. The lack of confidence stemmed from the use of an expired test gas used for the instrument calibration. The inspectors verified that the licensee was

ensuring that the testing gas was properly maintained to obtain an accurate calibration. The inspectors reviewed the most recent calibration and testing results and found no issues. The licensee later determined that the detectors were set to alarm conservatively, hence they retracted the notifications. These events are considered closed.

The inspectors evaluated the licensee's initial response to two separate event notifications # 44417 and 44435 reported on August 15, and August 22, 2008, respectively. Both events dealt with material discrepancy alarms and reported pursuant to 10 CFR 74.57. The licensee's initial corrective actions determined no actual loss of material occurred. Event # 44417 was reviewed and closed in inspection report 70-143/2005-205 with no issues. The long term actions for Event #44435 will be reviewed during a future Material, Control and Accountability inspection.

On October 1, 2008, the licensee reported a fitness for duty issue under 10 CFR 26 (NRC event #44532). This issue will be followed up under a future security inspection and will remain open.

## **7. Follow-up on Previously Identified Issues**

(Closed) Inspector Follow-up Item (IFI) 70-143/2006-07-01: Licensee's actions to address post-maintenance deficiency when safety control affects more than one system. This IFI was opened to track the licensee's actions with regard to post-maintenance testing of safety controls that affect more than one system. The inspectors reviewed the licensee's actions to combine (or cross-reference) testing procedures for systems with safety controls that affect multiple systems. The inspectors determined that combining the testing procedures into one (or referring to additional procedures that are required to be performed) adequately addressed the issue of testing safety controls that affect multiple systems. Based on the examples reviewed and the licensee's commitment to review the electronic listing of testing procedures to verify if other tests need to be combined, the inspectors determined this item to be adequately addressed. This item is closed.

(Closed) Violation (VIO) 70-143/2008-01-02: Failure to perform SRE testing in accordance with plant procedures. The inspectors reviewed the licensee's corrective actions involving the verifications of the pipe sleeve wall-penetrations. Originally, the penetrations, and often the sleeves themselves, were covered in a cement-like fire retardant material. Covering the sleeves with this material made verification of the sleeve presence and integrity nearly impossible. Therefore, the inspectors verified that the wall penetrations now had removable putty, which was required to be removed to verify the presence of the pipe sleeves. Several of the pipe penetrations were moved and no longer required fire retardant material. Based on the verification of the corrective actions, this violation is considered closed.

(Closed) VIO 70-143/2007-03-01: Failure to implement NFS safety procedures during 306 diesel generator/UPS/ABT maintenance activities. The inspectors reviewed the corrective actions regarding the activities involving the testing of the 306 diesel generator system without approved procedures. The licensee committed to requiring

special work instructions to be approved by the engineer's supervisor. The inspectors verified that the special work instructions were approved prior the most recent generator maintenance activities. The inspectors also verified that the lock-out/tag-out procedure was properly modified to insure NFS employees would always have a lock in place and are last to remove a lock upon completion of work. This violation is considered closed.

(Closed) VIO 70-143/2007-01-01: Failure to Follow, Maintain, and Develop Fire Protection Procedures. This issue is related to the failure to maintain or revise fire response and operation of Halon Suppression System. The licensee replaced the Halon system with portable fire extinguishers, installed an early warning smoke detection system, and installed/tested a manual pull station in the area. In addition, the licensee provided training to personnel regarding response to fires, operation of fire extinguishers, and safety practices to prevent inadvertent operation of the remaining Halon system. This item is closed.

(Closed) IFI 70-143/2007-01-02: Set Point Calculations. This issue is related to the licensee's handling of carbon dioxide tank reserve level inspections. The licensee reviewed the carbon dioxide suppression inspection procedure to verify the inclusion of the minimum designed capacity level of the system, as indicated in the set point calculations. The inspectors reviewed the design calculations for the system and confirmed the minimum designed capacity of the system. This item is closed.

(Closed) IFI 70-143/2007-01-03: Old Fire Protection Manual. The licensee amended the license application to remove the reference to the Old Fire Protection Manual. The licensee determined that the Old Manual was obsolete since the ISA provides the basis for the fire protection program. The inspectors did not identify any safety issue. This item is closed.

(Closed) VIO 70-143/2006-02-03: Failure to Comply with Entry/Exit procedure Requirements From a Controlled Area. Inspectors reviewed actions taken to ensure that proper controls are established for exiting and entering the Controlled Area when temporary entrance points are established. The licensee actions included arrangements to ensure that designated Health Physics personnel are contacted prior to the scheduled tour or entry into the Controlled Area. Health Physics personnel then ensure that appropriate protective clothing and supplies are made available at the entry and exit location. The inspectors discussed details with licensee personnel to confirm that program details were adequately communicated to responsible individuals. The inspectors had no further questions. This item is now closed.

(Closed) VIO 2008-01-03: Two examples of failure to follow radiological procedure requirements. The licensee has established a program to track and trend these type issues as part of their Human Performance enhancement initiative. The inspectors noted that the examples associated with this violation involved failure to use the prescribed protective clothing and to follow proper controlled area exit procedures. Both incidents were of low safety significance. The inspectors noted that the monitoring program will track and trend the occurrence of these type incidents and corrective actions will be predicated on the safety significance of a specific occurrence. The inspector discussed the details with licensee personnel to confirm that the Human

Performance monitoring program will adequately address these type issues and that appropriate mechanisms are in place to initiate appropriate corrective actions. This item is now closed.

**8. Exit Meeting**

The inspection scope and results were presented to members of the licensee's staff at various meetings throughout the inspection period and were summarized on October 9, 2008, with the licensee's management. No dissenting comments were received from the licensee. Proprietary information was discussed but not included in the report.

## ATTACHMENT

### 1. PERSONS CONTACTED

#### Partial List of Licensee's Persons Contacted

T. Lindstrom, General Manager  
M. Moore, Vice President, Safety & Regulatory  
R. Droke, Licensing Director  
T. Coates, Engineering Section Manager  
R. Shackelford, Nuclear Criticality Safety Manager  
G. Athon, Vice President, Applied Technology/Principle Scientist  
M. Tester, Sr. Manager, Radiation Control  
A. Vaughan, Director Fuel Production

### 2. INSPECTION PROCEDURES USED

IP 88135      Resident Inspectors Program for Category 1 Fuel Cycle Facilities  
IP 88020      Plant Operations  
IP 88030      Radiation Protection  
IP 88055      Fire Protection (Annual)  
IP 88050      Emergency Preparedness

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

<u>Item Number</u>	<u>Status</u>	<u>Type/Description</u>
70-143/2008-03-01	Open/Closed	NCV - Failure to Follow a Stop Movement Order (Paragraph 2.a)
70-143/2008-03-02	Open	VIO - Failure to Inspect Fire Dampers (Paragraph 2.c)
70-143/2008-03-03	Open	URI – Combustible Material Control in Building 310 (Paragraph 2.c)
70-143/2008-03-04	Open	IFI – Improper Escort Control (Paragraph 5)
70-143/2006-07-01	Closed	IFI - Licensee's actions to address post-maintenance deficiency when safety control affects more than one system.
70-143/2008-01-02	Closed	VIO - Failure to perform SRE testing in accordance with plant procedures.
70-143/2007-03-01	Closed	VIO - Failure to implement NFS safety procedures during 306 diesel generator/UPS/ABT maintenance activities

70-143/2007-01-01	Closed	VIO - Failure to Follow, Maintain, and Develop Fire Protection Procedures
70-143/2007-01-02	Closed	IFI - Set Point Calculations
70-143/2007-01-03	Closed	IFI - Old Fire Protection Manual
70-143/2006-02-03	Closed	VIO - Failure to Comply with Entry/Exit procedure Requirements From a Controlled Area
70-143/2008-01-03	Closed	VIO - Two examples of failure to follow radiological procedure requirements