



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

July 28, 2011

EN 46851  
NMED 110233

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

**SUBJECT: NRC INTEGRATED INSPECTION REPORT NO. 70-143/2011-003 AND NOTICE  
OF VIOLATION**

Dear Mr. Henry:

This refers to the inspection conducted from April 1, 2011 to June 30, 2011, at the Nuclear Fuel Services (NFS) facility in Erwin, TN. The purpose of this inspection was to determine whether activities authorized under the license were conducted safely and in accordance with NRC requirements. The enclosed report presents the results of this inspection. At the conclusion of the inspection, the findings were discussed on July 13, 2011, with those members of your staff identified in the enclosed report.

During this inspection, the NRC staff examined activities conducted under your license as they related to public health and safety, and the common defense and security, 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 a selective examination of procedures and representative records, observations of activities in progress, and interviews with personnel.

Based on the results of this inspection, the NRC has determined that two Severity Level IV violations of NRC requirements occurred. These violations were evaluated in accordance with the NRC Enforcement Policy. The current Enforcement Policy is included on the NRC's Web site at (<http://www.nrc.gov/about-nrc/regulatory/enforcement/enforce-pol.html>).

The violations are cited in the enclosed Notices of Violation (Notice) and the circumstances surrounding them are described in detail in the subject inspection report. The violations are being cited in the Notices because they are considered self revealing and were not identified by the licensee.

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

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

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosures, and your response, if you choose to provide one, 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/*

Steven J. Vias, 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. 70-143/2011-003

cc w/encls: (See page 3)

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

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 Fuel Facility Inspection Branch 1  
 Division of Fuel Facility Inspection

Docket No. 70-143  
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1. Notice of Violation
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cc w/encls: (See page 3)

PUBLICLY AVAILABLE       NON-PUBLICLY AVAILABLE       SENSITIVE       NON-SENSITIVE

ADAMS: X Yes      ACCESSION NUMBER: ML112092311      X SUNSI REVIEW COMPLETE X FORM 665 ATTACHED

OFFICE	RII:DFFI	RII:DFFI	RII:DFFI	RII:DFFI	RII:DFFI	RII:DFFI	
SIGNATURE	Via phone /RA/	/RA/	Via email /RA/	Via email /RA/	/RA/	/RA/	
NAME	MCrespo	GSmith	MChitty	JPelchat	RGibson	LPitts	
DATE	7/28/11	7/28/11	7/28/11	7/28/11	7/28/11	7/28/11	7/ /2011
E-MAIL COPY?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO

cc w/encls:

Christa Reed  
Director, Operations  
Nuclear Fuel Services, Inc.  
Electronic Mail Distribution

Mark Elliott  
Quality, Safety, & Safeguards Director  
Nuclear Fuel Services, Inc.  
Electronic Mail Distribution

Debra G. Shults  
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  
P.O. Box 169  
Unicoi, TN 37692

George Aprahamian  
Manager, Program Field Office – NFS  
Knolls Atomic Power Laboratory  
1205 Banner Hill Rd  
Erwin, TN 37650

Letter to Mr. Joseph Henry from Steven J. Vias dated July 28, 2011

SUBJECT: NRC INTEGRATED INSPECTION REPORT NO. 70-143/2011-003 AND NOTICE  
OF VIOLATION

Distribution w/encls:

PUBLIC

[nmed@inl.gov](mailto:nmed@inl.gov)

N. Baker, NMSS

M. Chitty, RII

R. Johnson, NMSS

J. Pelchat, RII

K. Ramsey, NMSS

G. Smith, RII

S. Vias, RII

NFS Website

## NOTICE OF VIOLATION

Nuclear Fuel Services, Inc.  
Erwin, Tennessee

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

During an NRC inspection conducted from April 1 to June 30, 2011, violations of NRC requirements were identified. In accordance with the NRC Enforcement Policy, the violations are listed below:

- A. 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 2.12.4.2 of the License Application states in part that, "procedures developed to support management measures shall be approved by the appropriate functional discipline manager and the safety discipline manager."

Contrary to the above, prior to January 21, 2011, "Column Dissolver Processing Instructions," Work Instruction 409-51A-301, Revision (Rev. 3), was developed to support management measures without being approved by the appropriate safety discipline manager. Specifically, the safety discipline manager did not approve the work instruction form even though it contained process input parameters that negatively affected the performance of the chemical safety items relied on for safety CDCD-24 through CDCD-31. Subsequently, a buildup of nitrogen oxide vapor in the column dissolver glove-box occurred.

This example of failing to properly approve and evaluate a procedure constitutes a Severity Level IV Violation (Section 6.2).

- B. Safety Condition S-1 of 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 2.11.1 of the License Application states, in part, that "The Configuration Management (CM) Program applies to items relied on for safety (IROFS) contained in the Integrated Safety Analysis (ISA) and other structures, systems, and components (SSCs) that are required to physically process, store, or transfer more than 350 grams of U-235 as Special Nuclear Material (SNM) contained within the SSC at any given time."

Section 2.11.2.1 of the License Application states, in part, that "The production or operations discipline is responsible for production related activities involving the handling and processing of SNM, including developing operating procedures and maintaining facilities and equipment in a safe operating condition and in accordance with the CM program."

Contrary to the above, on April 25, 2011, the production or operations discipline failed to develop operating procedures and maintain facilities and equipment in a safe operating condition in accordance with the CM program. Specifically, insufficient procedural guidance was provided to the maintenance technicians to ensure adequate control was

maintained over configuration control equipment, namely a control valve that transfers large quantities of SNM. Subsequently, a spill of high enriched material occurred as a result of an improperly installed valve actuator in the uranium-oxide system.

This example of failing to develop an adequate procedure to maintain configuration control constitutes a Severity Level IV Violation (Section 6.2).

Pursuant to the provisions of 10 CFR 2.201, NFS, Inc. is hereby required to submit a written statement or explanation to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with a copy to the Regional Administrator, Region II, and a copy to the NRC Resident Inspector at NFS, Inc., 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, and (4) the date when full compliance will be achieved. Your response may reference or include previous 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, with the basis for your denial, to the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001.

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

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

Dated this 28<sup>th</sup> day of July, 2011

U. S. NUCLEAR REGULATORY COMMISSION  
REGION II

Docket No.: 70-143

License No.: SNM-124

Report No.: 70-143/2011-003

Licensee: Nuclear Fuel Services, Inc.

Facility: Erwin Facility

Location: Erwin, TN 37650

Dates: April 1, 2011 to June 30, 2011

Inspectors: G. Smith, Senior Resident Inspector  
M. Chitty, Resident Inspector  
L. Pitts, Senior Fuel Facility Inspector  
J. Pelchat, Senior Fuel Facility Inspector  
R. Gibson, Senior Fuel Facility Inspector  
M. Crespo, Senior Fuel Facility Inspector

Approved by: S. Vias, Chief  
Fuel Facility Inspection Branch 1  
Division of Fuel Facility Inspection



## **EXECUTIVE SUMMARY**

Nuclear Fuel Services, Inc.  
NRC Integrated Inspection Report 70-143/2011-003  
April 1 - June 30, 2011

Inspections were conducted by the 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, independent verification of safety system status and limiting operation conditions, corrective actions, and a review of facility records.

### **Safety Operations**

- Plant operations were performed safely and in accordance with approved plant procedures. (Paragraphs A.1)
- Criticality controls were followed throughout the facility. (Paragraph A.2)
- Fire Protection equipment and barriers were adequately maintained. (Paragraphs A.3 and A.4)
- The licensee's training and qualification program for salaried employees was found to be adequate. (Paragraph A.5)

### **Radiological Controls**

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

### **Facility Support**

- A violation was identified for an improperly installed valve actuator in the uranium oxide (U-Oxide) system that resulted in a spill of high enriched uranium. (Paragraph C.1)
- The licensee's management measures for developing and implementing strike contingency plans to ensure plant safety and security were adequate. (Paragraph C.2)

### **Special Topics**

- A violation was identified involving improper use of a Work Instruction to change process parameters that could affect management measures. (Paragraph D.2.a)

### **Attachment**

Partial List of Persons Contacted  
List of Items Opened, Closed, and Discussed  
Inspection Procedures Used

## **REPORT DETAILS**

### **Summary of Plant Status**

The facility began the inspection period with the following process areas operating: 1) Fuel manufacturing facility (FMF); 2) Blended Low Enriched Uranium (BLEU) Preparation Facility (BPF) which included the Uranium (U)-Aluminum, U-Oxide, U-Metal, Solvent Extraction (SX), and the down-blending (DB) lines; and 3) Building 301 Commercial Development (CD) lines which included the Column Dissolvers and the Ammonium Diuranate (ADU) system. The U-Hexafluoride (UF<sub>6</sub>) systems in the CD line of Building 301 began the period shutdown pursuant to a confirmatory action letter (CAL) issued on January 7, 2010. A fifth restart readiness assessment which focused on the Building 301 UF<sub>6</sub> systems was conducted during this period. The results of that inspection will be documented in NRC Inspection Report 70-143/2011-007. On July 12, the NRC authorized restart of the remaining UF<sub>6</sub> systems based on the inspection results. The UF<sub>6</sub> systems in the CD line remained in a shutdown condition for the remainder of the inspection period due to licensee priorities. On May 15, NFS management and hourly employees ratified a new multiyear labor contract.

### **A. Safety Operations**

#### **1. Plant Operations (IP 88135 and 88020)**

##### **a. Inspection Scope and Observations**

The inspectors performed daily tours of plant operating areas housing special nuclear materials (SNM) and determined that equipment and systems were operated safely and in compliance with the license. Daily operational meetings and turnover meetings were observed throughout the period where production status and operational issues were discussed. The inspectors reviewed selected licensee-identified events and corrective actions for previously identified events. The inspectors focused on plant operations, safety related equipment (i.e. valves, sensors, instrumentation, in-line monitors, scales, etc) and items relied on for safety (IROFS).

The daily tours included walk-downs of the BPF, CD line, FMF, storage areas, vaults, and the waste treatment facility. The inspectors verified that there was adequate staffing and that operators were attentive to their duties and 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 were being controlled. 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 log books, Lockout/Tagout records, and Letters of Authorization (temporary modifications) to obtain information concerning operating trends and activities. The inspectors verified the licensee actively pursued corrective actions for conditions requiring temporary modifications and that compensatory measures were prescribed as required.

The inspectors performed periodic tours of the outlying 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 hazards and protection features, combustible material storage and fire

loading, hazardous chemical storage, storage of compressed gas containers, potential degradation of plant security features, and potential fire hazards. During these tours, the inspectors also verified that required Notices to workers were appropriately and conspicuously posted in accordance with 10 CFR 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.

During the inspection period, the inspectors performed two walk-downs of safety-significant systems involved with the processing of SNM. As part of the walk-downs, inspectors verified the as-built configuration matched approved plant drawings. The inspectors interviewed operators in order to ensure 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 examined included:

- Waste Treatment Facility, Liquid Effluent Discharge system
- Building 333, Solvent Extraction system

To determine the correct system alignment, the inspectors reviewed the procedures, drawings, related ISAs, and 10 CFR 70.61. During the walk-downs, the inspectors verified the following:

- Criticality safety hazards and controls were maintained;
- Chemical safety hazards and controls were maintained;
- The configuration of metal and glass columns was maintained in accordance with Nuclear Criticality Safety Evaluations;
- Valves were correctly positioned and did not exhibit leakage that would impact the valve's function;
- Electrical power was available as required;
- Major system components were correctly labeled, lubricated, cooled, ventilated, etc.;
- Hangers and supports were correctly installed and functional;
- Tagging clearances were appropriate with breakers and valves correctly positioned and locked as required by the lockout/tagout program;
- Cabinets, cable trays, and conduits were correctly installed and functional;
- Visible cabling appeared to be in good material condition;
- Essential support systems were operational; and
- Ancillary equipment or debris did not interfere with system performance.

The inspectors evaluated the implementation of IROFS in the fuel manufacturing facility (FMF). The inspectors walked down select IROFS on the process floor of the FMF. The inspectors also discussed the performance and safety function of IROFS with operators of the area. The inspectors also evaluated several safety related equipment (SRE) set point calculations to verify that the IROFS would adequately perform their safety function.

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.

b. Conclusion

No findings of significance were identified.

3. Fire Protection (IP 88135)

a. Inspection Scope and Observations

During daily plant tours, the inspectors verified that transient combustibles were being adequately controlled and minimized and that fire barriers located between fire areas were being properly maintained.

During the inspection period, the inspectors conducted a fire safety tour of the solvent extraction room in building 333. The inspectors verified adequate control of combustible material. The inspectors walked down various fire suppression components and systems that supplied the area and verified these systems were properly aligned and operational. The inspectors verified that various aspects of the fire protection/prevention strategies conformed to the applicable nuclear criticality safety evaluation.

b. Conclusion

No findings of significance were identified.

#### 4. Annual Fire Protection (IP 88055)

##### a. Inspection Scope and Observations

During the inspection, the inspectors conducted a fire safety tour of the safety-related areas of the facility. The inspectors verified that control of combustible material was in accordance with site procedures. The inspectors walked down various fire suppression systems and components and verified these systems were properly aligned and operational. The inspectors verified that sprinkler systems were not obstructed, that the water supply to the system was readily available with correct valve positioning and pumping capability, and that there was no visual evidence of physical degradation. Additionally, the inspectors verified that the appropriate inspections, testing and maintenance had been performed to ensure that the safety-related fire protection components were being maintained in an operable status. The inspectors walked down the passive fire protection features and noted that fire doors and fire dampers were in good condition, and penetrations in fire walls were properly sealed. The inspectors noted that the licensee had replaced numerous fire doors. The inspectors reviewed an audit of the fire protection program and verified that adequate corrective actions were identified for issues identified during the audit.

##### b. Conclusion

No findings of significance were identified.

#### 5. Operator Training (IP 88010)

##### a. Inspection Scope and Observations

The inspectors reviewed the licensee's operator training and qualification program with a focus on the training and qualification of salaried employees designated to assume the duties of hourly personnel should a work stoppage occur. The inspection included a review of training procedures, lesson plans, procedures, documented training, and completed qualification packages. The inspectors also observed classroom training and on-the-job training conducted on the production floor.

The inspectors reviewed the operator training program and evaluated the program against Section 2.12.3 of the application for NRC license SNM-124, dated December 14, 2007. The inspectors reviewed the following procedures:

- NFS-TN-008, "NFS Training Procedure," Rev. 11;
- NFS-PD-001, "Management of the On-Line Training and Qualification System," Rev. 2; and
- NFS-TRN-OJTGUIDE, "Guidance Document for Conduct of On-The-Job Training," Rev. 0.

The inspectors determined that the training and qualification program for salaried employees was formal and used approved procedures. The inspectors verified that the procedures complied with regulatory requirements.

The inspectors discussed and observed training with selected staff in a variety of positions. The inspectors observed representative portions of classroom training as well as on-the-job training for operating effluent treatment systems. The inspectors verified that the instructor was properly qualified. Classroom training involved discussions of applicable procedures; descriptions of the associated safety-related equipment; conduct of operations including the use of procedures; and, the use of appropriate personal protective equipment. The inspectors noted that the training activity addressed skills identified in the training curriculum. Students were observed to be alert and actively participated in the training. The inspectors determined that operators were being trained in accordance with regulatory requirements.

The licensee implemented an on-line system for documenting the completion of initial training and tracking required refresher training. The system was also designed to prevent an employee from gaining access to a protected area if the prerequisite initial and refresher training had not been completed as required. The inspector interviewed several licensee employees and reviewed a representative sample of records maintained in this system. No instances of individuals being permitting access without successful completion of the required training were identified.

The inspectors focused their reviews on records documenting the training and qualifications of salaried employees identified by licensee management as responsible for assuming the duties of hourly personnel during the initial phase of a work stoppage should one occur. The inspectors verified that these individuals had completed the required training and qualification process to assume their new duties if required.

b. Conclusion

No findings of significance were identified.

**B. Radiological Controls**

1. Radiation Protection (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 (RWP). 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 reviewed the calibration due dates of those instruments.

The inspectors reviewed RWP's associated with the following Safety Work Permits (SWPs):

- On April 20, inspectors performed a review of SWP #11-32-006, building 333 U-Oxide which was issued to repair valves HV-3A08 and HV-3B22B and to remove the "B" U-Oxide Dissolver purge line and clear blockage.
- On April 28, inspectors performed a review of SWP #14376 which was issued to clear a clog in the aluminum nitrate system.
- On June 1, inspectors performed a review of SWP #11-39-021 which was issued to replace the 301 Column Dissolver 4A01 pump.

The inspectors determined that the reviewed RWPs contained sufficient detail and were adequately implemented in order to ensure personnel exposure was maintained as low as reasonably achievable (ALARA).

b. Conclusion

No findings of significance were identified.

2. Radiation Protection (IP 88030)

a. Inspection Scope and Observations

The inspectors evaluated the performance of the radiation protection program to verify that it was being implemented and documented in accordance with regulatory requirements. The inspectors reviewed the semi-annual Radiation Protection (RP) report to determine the adequacy of RP health and safety. The inspectors discussed organizational changes and personnel responsibilities with the RP Manager (RPM) responsible for radiological controls. No major organizational changes had occurred since the last inspection. There was one vacancy open for a health physics (HP) position. The inspectors verified the RP program was independent of operations with the RPM reporting to the Nuclear Safety and Licensing Manager. The inspectors reviewed monthly and annual RP program audits performed by the HP and RPMs. The inspectors noted that the managers performed departmental self-assessments of the RP program and employee work practices. The inspectors determined that the licensee adequately implemented the RP program consistent with the license and regulatory requirements.

The inspectors reviewed RP procedures to determine that details specified in the procedures were consistent with regulations and license requirements. Through interviews with responsible staff, the inspectors determined that RP procedures were reviewed and updated when necessary and contained a reasonable level of detail for the operations involved. The inspectors determined that the RP procedures were reviewed, approved, and implemented in accordance with regulations and license requirements.

The inspectors examined selected portable survey instruments and fixed monitoring equipment to determine operability and calibration status. The inspectors reviewed records associated with the calibration of portable survey instruments and portal monitors. Calibration and functional performance check procedures were found to be

current and adequate. The inspectors reviewed calibration and source response check sources for appropriate configuration and to confirm suitability of sources for their intended function. The inspectors noted that the licensee performed instrument calibrations on site. The inspectors reviewed selected calibration records for accuracy and completeness. The inspectors determined that radiation protection instruments and equipment were calibrated and operated in accordance with the applicable license requirements and licensee procedures.

The inspectors reviewed selected personnel exposure data to verify that exposures were maintained ALARA and within the limits of 10 CFR 20.1201. The licensee's dosimetry provider was accredited by the National Voluntary Laboratory Accreditation Program. Table 1 below displays the occupational exposure data for calendar years (CYs) 2008 through 2010.

**Table 1 – Occupational Exposure Data**

Year	Deep Dose Equivalent (DDE)-rem	Committed Effective Dose Equivalent (CEDE)-rem	Total Effective Dose Equivalent (TEDE)-rem
2008	0.878	0.565	0.942
2009	0.312	0.402	0.511
2010	0.185	0.205	0.225

The inspectors discussed with the HP manager the downward trend in the occupational exposures from CY 2009 to CY 2010. The licensee determined that the downward trend was contributed to the low external exposure from the source (feed) material, engineering controls to the glove boxes (e.g., a tool use to change out the glove ports without breaching containment), and a more rigorous training program to reduce the uptake for internal exposure. All occupational radiation doses were well below regulatory limits.

The inspectors reviewed the licensee's *in vitro* and *in vivo* bioassay program used to assess the uptake of uranium by workers and the adequacy of the RP program. The licensee's calculation of internal dose to employees was based on the counting results from stationary air samplers and lapel samplers. The results of urine bioassays and lung counts were used to validate the internal dose calculations based on the air sampling program. The inspectors reviewed procedures and documentation associated with bioassay exposure calculations. The licensee used urine bioassay for the *in vitro* portion of its bioassay program. Personnel were knowledgeable of the procedures for preparing and processing urine samples for uranium analysis. The licensee analyzed urine samples on site using the Kinetic Phosphorescence Analyzer (KPA). The inspectors interviewed personnel responsible for the review and maintenance of bioassay exposure records and found the individuals to be knowledgeable of program requirements. The inspectors observed the administration of an *in vivo* lung count and reviewed procedures associated with the lung counting program. The inspectors determined that the licensee's bioassay program was conducted in accordance with regulatory requirements.



The inspectors reviewed elements of the licensee's program relating to the use and maintenance of respiratory protection equipment. Licensee employees wore a respirator a single time and then turned it in. Staff members responsible for the maintenance of respirators disassemble, clean, and rebuild the respirators prior to reuse. Based on field observations and discussions with responsible personnel, the inspectors determined that the respiratory protection equipment was adequately maintained and handled in accordance with approved procedures. Provisions to ensure that only qualified individuals use respiratory protection equipment were adequate and implemented in accordance with approved procedures. Exposures were less than the occupational limits in 10 CFR 20.1201. The inspectors concluded that the licensee's respiratory protection program was adequate.

The inspectors reviewed radiological signs and postings within the controlled areas and to entrances leading into the controlled areas to determine compliance with regulatory requirements. Radiological areas were posted in accordance with license conditions and accurately reflected radiological conditions in the areas. The inspectors walked down the Building 234 containment which is used for the excavating of soil containing plutonium-239, the Fuel Manufacturing Facility, and the BLEU complex. The inspectors noted that the facilities were adequately posted and controlled.

The radiation survey program was reviewed to determine if surveys were effective in the identification of airborne particles and surface contamination. The inspectors reviewed and determined that the licensee had established schedules for periodic surveys of work areas. The inspectors observed RP technicians performing routine surveys in the fuel manufacturing areas and the exit locations from the controlled areas and determined that the technicians demonstrated adequate contamination survey techniques. The inspectors also observed the RP technicians collecting stationary air samples in the controlled areas of fuel manufacturing and the BLEU complex.

The inspectors reviewed selected survey results for accuracy and completeness. Procedures associated with the scheduling and performance of radiological surveillance activities were found to be adequate. The radiation and contamination survey programs were appropriately implemented to protect workers and identify potential work areas posing an internal or external radiation hazard.

The licensee's ALARA program was reviewed to determine if the program and ALARA goals were developed and implemented in accordance with the license. On a quarterly basis, the licensee conducted Safety and Safeguards Review Council meetings detailing ALARA goals and exposure summaries to identify undesirable trends. In cases where exposures were elevated, consideration was given to ways for reducing exposures. The licensee was below the ALARA goals it had set for CY 2010. The inspectors interviewed the Health Physicist assigned responsibility for the ALARA evaluations and assessments. The licensee had implemented many ALARA initiatives to raise the awareness of ALARA practices among plant operators and floor managers. Based on records reviewed and interviews, the inspectors determined that the licensee's ALARA program was properly implemented.

b. Conclusion

No findings of significance were identified.

3. Decommissioning Activities (IP88135)

a. Inspection Scope and Observations

On April 6, June 8, 9, 15, and 17, the inspectors performed split sampling of the North Site soil samples. The North Site is currently undergoing a decommissioning process that complies with the NRC-approved Decommissioning Plan. The inspectors verified proper chain of custody of soil samples in accordance with NFS-DC-103, "Soil, Sediment and Waste Sampling, Sample Custody, Sample Shipping and Transfer," Rev. 7. On April 11, June 14, and June 20, the inspectors verified proper packing and shipping of the samples which were sent to NRC's contracted laboratory, Oak Ridge Institute for Science and Education (ORISE), for independent, radiological analyses.

b. Conclusion

No findings of significance were identified.

**C. Facility Support**

1. Maintenance/Surveillance (IP 88135)

a. Inspection Scope and Observations

The inspectors reviewed a sample of work requests and all corrective action program (CAP) reports based on their safety or safeguards risk significance. The inspectors reviewed the licensee's CAP to ensure that items adverse to safety were being identified and tracked to closure. To aid in the identification of repetitive equipment failures or specific human performance issues for follow-up, the inspectors performed frequent screenings of items entered into the CAP.

The inspectors performed a detailed review of five work requests (WRs) involving safety-related equipment or IROFS. The inspectors reviewed the WRs for proper identification of IROFS and inclusion of post maintenance Safety Related Equipment (SRE) testing. The inspectors also evaluated the WRs for compliance with applicable procedures.

Failure to Maintain Configuration Control During Maintenance

*Introduction:* A self-revealing violation of the NFS license was identified when a spill of SNM occurred in the U-Oxide system in building 333. The spill was caused by an improperly installed valve actuator that allowed process material to flow from one dissolver to another and ultimately out of the safety-related overflow lines and onto the process floor. Section 2.11.2.1 of the License Application requires, in part, that procedures maintain equipment in safe operating condition and in accordance with the

configuration management program. Contrary to this requirement, NFS failed to provide adequate procedures to plant personnel to ensure adequate configuration control of the U-Oxide system

*Description:* On April 25, 2011, following maintenance, the licensee began a transfer of SNM from the 'B' U-Oxide dissolver to columns in building 333. Soon after the transfer began, operations personnel received and responded to a high level alarm in the 'A' dissolver and noted SNM spilled onto the process floor from the safety-related overflow lines. The U-Oxide system was immediately shutdown and cleanup efforts initiated. The material was collected and the area was decontaminated within 24 hours and thus no formal notification to the NRC was required. The licensee entered the issue into the CAP and began a root cause investigation to analyze the event. A walk down of the system noted that the recently replaced actuator on valve HV-3A08A was improperly installed (rotated 90 degrees) such that flow was allowed from the 'B' to the 'A' dissolvers, contrary to the system design basis. A review of the work package (#152815) associated with this valve revealed that insufficient guidance was provided to maintenance personnel to ensure proper assembly of the actuator. The investigation concluded there were two main causal factors which were 1) incorrect installation and 2) lack of post maintenance checks or alignments. Several corrective actions and recommendations were generated as a result of this investigation. Following completion of the root cause analysis, follow on system recovery efforts were begun on May 17. Normal system operation was underway on May 23.

*Analysis:* The failure to maintain configuration control of equipment containing SNM is a performance deficiency and a violation of NRC requirements. This issue is more than minor because the failure resulted in the challenging of the safety-related IROFS, namely the dissolver overflow lines. The inspectors evaluated this issue in accordance with the enforcement policy and the enforcement manual and noted that the violation is of very low safety significance because the performance criteria of 10 CFR 70.61 were always maintained.

*Enforcement:* Section 2.11.2.1 of the License Application states, in part, that "The production or operations discipline is responsible for production-related activities involving the handling and processing of SNM, including developing operating procedures and maintaining facilities and equipment in a safe operating condition and in accordance with the CM program." Contrary to the above, on April 25, 2011, the production or operations discipline failed to develop operating procedures and maintain facilities and equipment in a safe operating condition in accordance with the CM program. Specifically, insufficient procedural guidance was provided to the maintenance technicians to ensure adequate control was maintained over configuration control equipment, namely a control valve that transfers large quantities of SNM. Subsequently, a spill of high enriched material occurred as a result of an improperly installed valve actuator in the U-Oxide system. The licensee entered the issue into the CAP as PIRCS item # 29658.

In accordance with the NRC Enforcement Policy, violations that are less serious, but are of more than minor concern, and that resulted in no or relatively inappreciable potential safety or security consequences are characterized as Severity Level IV violations. The failure to maintain configuration control of SNM-bearing equipment as required by the

facility license is a Severity Level IV violation (VIO) of NRC requirements and will be tracked as VIO 70-143/2011-003-01, Failure to Maintain Configuration Control During Maintenance.

b. Conclusion

One violation of NRC requirements was identified.

2. Management Organization and Controls (IP 88005) and Licensee Strike Contingency Plans (IP 92709)

a. Inspection Scope and Observations

At midnight on May 15, the contract between the United Steel Workers (USW) and the licensee was scheduled to expire. Negotiations began on April 21 and were successfully concluded with ratification of a renewed contract on May 15. Local 9677 of the United Steelworkers of America (USW) represented about 320 hourly employees including operators, maintenance personnel, radiation safety technicians, laboratory technicians and waste handlers employed by the licensee.

Prior to contract expiration, the inspectors reviewed the licensee's strike contingency plan and discussed the implementation of the plan with licensee management, operations, and security personnel to evaluate the plan's adequacy and to assess the licensee's readiness in the event of a job action. The inspectors reviewed the licensee's preparations to ensure that the required minimum number of qualified personnel would be available for the proper operation and safety of the facility. The inspectors also focused on the licensee's plans to provide adequate site security in the event of a labor-related work stoppage and met with representatives of the licensee, the union, and local law enforcement officials to ensure that NRC inspectors would have unfettered access to the site in the event that a job action ensued.

The inspectors also reviewed details associated with actions in progress necessary to implement the plan. The inspectors determined that licensee plans adequately addressed staffing requirements and actions necessary to ensure that plant systems were placed in a safe configuration to support safe shutdown in the event of a job action. The inspectors noted that the licensee had developed a work schedule to transition work activities from hourly to salaried employees.

The licensee's strike contingency plan called for utilizing already-qualified salaried personnel to staff the plant for a short period of time to take it from an initial shutdown condition followed by the resumption of limited process activities that would be needed to perform a material inventory scheduled for June. The licensee's plans included estimates of the time required to train additional salaried staff needed to resume some production activities. The licensee planned to limit resumed licensed activities to certain production processes and facilities with no firm target date.

In meetings with the plant manager and other senior licensee management before the contract expiration date, the inspectors discussed the anticipated impact of a potential job action and compensatory measures that the licensee had developed for coping with the safety impacts of such a work stoppage. Specifically, the inspectors reviewed the licensee's assumptions in developing these compensatory measures including:

- the number and job classifications of potential strikers;
- the readiness of the safety contingency plan submitted to NRC for its review;
- the anticipated duration of any work stoppage;
- the process for training and qualifying sufficient staff for safety-critical positions adequate for the assumed duration; and,
- the contingencies for plant operations if the duration of the work stoppage exceeded the anticipated duration.

The inspectors interviewed plant management personnel and reviewed the licensee's provisions for ensuring that overtime and work hours would be managed to minimize the impact of fatigue on plant personnel should contract negotiations evolve into a protracted labor dispute. The inspectors noted that the licensee had developed a schedule to ensure that safety and security-critical plant staff would be adequately rested with a sufficient number of employees available to staff operating shifts with particular attention given to the following areas: operations; maintenance; HP & industrial safety; emergency response; quality assurance; and security.

The inspectors interviewed the security manager and officers of the uniformed security force and determined that hourly members of the uniformed guard force were represented by Local 145 of the International Guards Union of America and that the contract between the licensee and the guard union contained a no-strike clause that compelled members of the hourly guard force to cross any picket line and continue performing their assigned duties in the event of a work stoppage. Individual interviews with members of the hourly guard staff indicated that they intended to honor the terms of their labor contract in the event that the union representing hourly employees was not able to reach a labor accord with licensee management.

The inspectors reviewed training documentation for salaried personnel that would assume the duties of hourly employees during the initial phases of a work stoppage. During the period prior to the expiration of the contract, the inspectors reviewed a representative sample of records documenting various aspects of the licensee's training program including class room training and on the job training. The inspectors verified that the content and curriculum for training salaried employees slated to assume operating and maintenance activities satisfied the requirements specified in the NRC license.

The inspectors met with representatives of the Erwin City Police Department and the Unicoi County Sheriff's Office to discuss the NRC's ongoing oversight role in the event of any potential labor dispute and made arrangements to ensure continued unfettered site access to the licensee's facility should a work stoppage ensue. Local law enforcement officials provided the inspectors with information and guidance to follow in the event that inspectors experienced interference or difficulty gaining access to the site. The

inspectors noted that local law enforcement agencies were very open to ensuring NRC inspectors' retained unfettered access to the licensee's facility in the event of a job action.

The inspectors met with the USW Local President to discuss the NRC's oversight role in the event of a job action and the regulatory requirement that NRC inspectors have unfettered access to and from the site. The union representative acknowledged that she understood the requirement and would instruct the local membership not to impede NRC access to the site. The inspectors showed union representatives examples of credentials carried by inspectors and described the magnetic placards that vehicles driven by inspectors would have to identify the occupants as NRC officials. The local's leadership committed to continued cooperation with the NRC if a work stoppage were to occur to ensure that NRC inspectors could continue to have access to the licensee's facility. Arrangements were made to ensure that the union leadership and members of the NRC staff could readily communicate with each other. The inspectors noted that local labor union officials were also very open to ensuring NRC inspectors retained unfettered access to the licensee's facility in the event of a job action.

In accordance with NRC Inspection Procedure 92709, "Licensee Strike Contingency Plans," dated March 30, 2005, the NRC staff prepared inspection plans for the availability of a sufficient number of inspectors to provide oversight and verify safe shutdown of the plant in the event of a job action. These plans also provided sufficient coverage if the licensee elected to resume any licensed activities. Negotiations between licensee management and the union were successfully concluded with ratification of a renewed contract on May 15. During the negotiations period normal operations were not affected.

b. Conclusion

No findings of significance were identified.

**D. Special Topics**

1. Follow-up on Previously Identified Issues

a. VIO 70-143/2008-003-02: Failure To Inspect Fire Dampers

The inspectors reviewed the NFS Fire Damper inspection records and the corrective actions assigned by NFS to prevent recurrence of a similar event. The inspection records were found to be accurate and complete. The corrective actions were found to be adequate and included changes to NFS-GH-22, "Fire Door Barrier and Damper Inspection and Maintenance," that require a corrective action program entry when a fire damper cannot be tested or fails an inspection. Additionally, all IROFS related fire dampers have been added to the SRE program and non-IROFS related fire dampers have been added to the preventive maintenance program. The inspectors determined that NFS's corrective actions were adequate to correct and prevent recurrence this type of event. This item is considered closed.

b. VIO 70-143/2008-004-01: Failure To Adhere To Plant Procedures

The inspectors reviewed the final corrective actions remaining regarding the inadvertent transfer of tank WF-04 to the waste treatment facility. The final action was to perform an extent of condition on the valve line-up vulnerability on the WD tanks due to the similarity to the WF tanks. The licensee decided to install the same controls on the WD tanks to avoid similar issues. The inspectors reviewed the additional controls and found no issues. This item is considered closed.

c. URI 70-143/2008-004-05: Verification Of IROFS Pipe Material

The inspectors reviewed the results of NFS-GH-939, "Piping Integrity Plan," Rev. 3 to ensure the any potential deficiencies identified with material of construction for IROFS-related material were identified and properly corrected. The results of the evaluation identified no deficiencies. In addition, the records for the various piping components and material of constructions were now incorporated to the electronic configuration management system. The inspectors noted no issues with the results. This item is considered closed.

d. VIO 70-143/2009-003-01: Failure To Implement A Safety Program Required By 10 CFR 70.62 (105 lab)

The inspectors reviewed the corrective actions assigned by NFS to prevent recurrence of a similar event. The corrective actions included changes to NFS-GH-27, "Planned Impairments to Fire Protection Equipment," and NFS SOP 392, "Work Request Procedure." These procedures were revised to ensure that the ISA department identify the appropriate personnel to review the affect that a work request will have on IROFS. Additionally, NFS developed and documented a system for tracking fire impairments, and defined the specific roles and responsibilities necessary to adequately implement these procedure changes. The inspectors had no further questions regarding VIO 70-143/2009-003-01. This item is considered closed.

e. LER 70-143/2009-004: EN 45497: Fire In A Process Glove Box

The NRC's review of this event identified a violation of NRC requirements due to the inadequate design of a system containing special nuclear material (VIO 70-143/2009-004-01). Follow-up inspection for this event notification was performed and documented in this report as part of the review of NFS's actions to address VIO 70-143/2009-004-01. This item is considered closed.

f. VIO 70-143/2009-004-01: Inadequate Design Of A System Containing SNM

The inspectors interviewed NFS staff and reviewed the records and corrective actions identified by NFS in the Reply to Notice of Violation (EA-10-076), dated December 15, 2010. This violation resulted due to inadequate implementation of a facility change. This change did not identify or address the potential impacts of the change prior to placing the system in service. The corrective actions addressed the need for a more robust change control process. To improve the change control process, the site revised NFS-CM-004, "NFS Change Control Process," and NFS-TS-009, "Configuration

Management of Process Change.” The inspectors reviewed the changes to these procedures and determined that if properly followed, the additional procedural requirements should prevent additional issues of this type. This item is considered closed.

g. VIO 70-143/2010-002-02: Failure To Establish An Inspection Program For Sprinkler Systems Designated As IROFS

The inspectors interviewed NFS staff and reviewed the records and corrective actions identified by NFS in the Reply to Notice of Violation (VIO 70-143/2010-002-02), dated August 27, 2010. This violation was due to a procedure deficiency in that NFS's procedures omitted the National Fire Protection Association (NFPA) 25 requirements related to annual visual inspection of fire protection sprinkler systems. NFS performed a visual inspection of the associated sprinkler systems on May 27, 2010; this inspection was observed by an NRC inspector. This issue was entered into the site's corrective action program and NFS procedure, NFS-HS-A-16, was revised on March 28, 2011, to include an attachment entitled "ANNUAL SPRINKLER INSPECTION" to provide guidance for performance and documentation of the annual sprinkler system inspections. On May 18, the inspector observed performance of a sprinkler system inspection using Attachment 6 of NFS-HS-A-16; the inspector did not note any discrepancies with regards to performance of these inspections. NFS plans to implement NFS-HS-A-104, "Testing/Inspection of Fire Barrier Systems" and NFS-HS-B-95, "Testing/Inspection of Fire Barrier Systems" to provide checklists for tracking and documenting performance of required fire protection inspections. This item will remain open awaiting NFS's implementation of an adequate method to provide tracking and documentation of the completion of required fire protection inspections.

h. IFI-70-143/2010-003-03: Lack of Radiation Protection Operating Experience Systems

The inspectors determined that the licensee had no means to share operational experience nor did the license enter similar issues into the CAP. The inspectors discovered during this inspection that this IFI was captured in the licensee's CAP. Licensee's procedure NFS-OE-001, "Operating Experience Program," Rev. 1, was implemented to allow the program to capture and retrieve operational experiences and to provide metrics for measuring the effectiveness and cultural improvement of the program through external and internal sources. The inspectors reviewed the procedure and determined it to be adequate for implementing the operational experience program. This item is considered closed.

i. EI 70-143/2010-009-01: Failure To Provide Accurate Information In A Reply To A Notice Of Violation

The inspectors interviewed NFS staff and reviewed the records and corrective actions identified by NFS in the Reply to Notice of Violation (EA-10-076), dated December 15, 2010. The inspectors found that NFS was completing the assigned corrective actions as described. The corrective actions associated with this violation included an effectiveness review to be conducted by NFS within one year of the issuance of the



associated Confirmatory Order (dated November 16, 2010). This item will remain open until NFS has completed all actions required by the associated Confirmatory Order and those actions have been evaluated by the NRC.

j. EEI 70-143/2010-009-02: Failure To Provide Accurate Information To NRC Inspectors

The inspectors interviewed NFS staff and reviewed the records and corrective actions identified by NFS in the Reply to Notice of Violation (EA-10-076), dated December 15, 2010. The inspectors found that NFS was completing the assigned corrective actions as described. The corrective actions associated with this violation included an effectiveness review to be conducted by NFS within one year of the issuance of the associated confirmatory order (dated November 16, 2010). This item will remain open until NFS has completed all actions required by the associated Confirmatory Order and those actions have been evaluated by the NRC.

k. VIO 70-143-2010-003-02: Failure to Follow Procedure During SRE Testing

The inspectors reviewed the licensee's corrective actions with respect to this issue. The licensee implemented a training toolbox for operations and engineering personnel to reemphasize the importance of verbatim compliance with functional tests. The licensee also reemphasized the importance of verbatim compliance with the supervisors of the area. The inspectors reviewed the training materials and the list of attendees. No issues were noted. The inspectors also reviewed the status of the licensee's evaluation of SRE test instructions for utility supply systems (tracked as C15312 with a due date of June 30, 2012). The licensee's review was to focus on the clarity of the prerequisites and various steps. The licensee had not yet completed this action. This item will remain open to evaluate the results of the licensee's review.

2. 70-143/2011-006: Problem Identification & Resolution (PI&R) Inspection Report

a. A violation was identified involving improper use of a Work Instruction to change process parameters that could affect management measures.

*Introduction:* A self-revealing violation was identified when a failure to properly review and evaluate a Work Instruction (WI) contributed to the generation of NO<sub>x</sub> gases inside the CD line column dissolver glove box during the processing of uranium tetrafluoride (UF<sub>4</sub>). The inspectors determined that the WI used to process UF<sub>4</sub> was not developed in accordance with NFS' requirements for procedures that support management measures associated with IROFS. [This was previously discussed in Inspection Report 70-143/2011-006, Paragraph 2.a.(2).]

*Description:* On January 21, 2011, during the initial processing of UF<sub>4</sub> in the building 301 column dissolver, a significant amount of NO<sub>x</sub> gases were noted inside the glove box of the dissolver. The gases appeared following the elimination of the hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>) phase of the process. The H<sub>2</sub>O<sub>2</sub> is used to help reduce the amount of NO<sub>x</sub> gases. The licensee entered the issue into the CAP as PIRCS #28533 and the licensee began an investigation to evaluate the root cause of the event. The investigation by the licensee revealed that WI 409-51A-301 utilized operating 19

parameters different than the initial laboratory test plan for processing UF<sub>4</sub>. The test plan formed the design basis for the initial modification authorizing the UF<sub>4</sub> processing methodology. The specific differences included nitric acid concentration, frequency of UF<sub>4</sub> addition, ratio of H<sub>2</sub>O<sub>2</sub> to U, and target U concentration. The WI was approved on Oct 12, 2010 by the process engineer and the building manager. WI do not receive the same level of review and approval as normal plant procedures. The inspectors determined in this particular case, a WI was not an appropriate mechanism to alter or affect process parameters that had the potential to affect the prescribed management measures in the CD line column dissolver. Those management measures consisted of ensuring the proper amount of UF<sub>4</sub> and H<sub>2</sub>O<sub>2</sub> are added to the dissolver in order to minimize or eliminate NO<sub>x</sub> generation. Subsequent corrective actions included the reanalysis of the WI associated with the process; extended dissolution times, and enhanced filtering of the process to ensure undissolved solids removed prior to elimination of H<sub>2</sub>O<sub>2</sub>.

*Analysis:* The failure to properly review and approve a procedure affecting management measures associated with IROFS is a performance deficiency and a violation of NRC requirements. This issue is more than minor because the failure resulted in a significant generation of NO<sub>x</sub> gases inside the glovebox. The generation of NO<sub>x</sub> gases inside the glovebox did not affect workers or the environment since the NO<sub>x</sub> gases were removed by the building scrubber system. In accordance with the NRC Enforcement Policy, violations that are those that are less serious, but are of more than minor concern, and that resulted in no or relatively inappreciable potential safety or security consequences are characterized as Severity Level IV violations.

*Enforcement:* Section 2.12.4.2 of the License Application states in part that, "procedures developed to support management measures shall be approved by the appropriate functional discipline manager and the safety discipline manager." Contrary to the above, "Column Dissolver Processing Instructions," WI 409-51A-301, Rev. 3, was developed to support management measures without being approved by the appropriate safety discipline manager. Specifically, the safety discipline manager did not approve the WI form even though it contained process input parameters that negatively affected the performance of chemical safety IROFS CDCD-24 through CDCD-31. The WI specified U input quantities, which affect IROFS CDCD-24, 25, 28, and 29. These IROFS required that the operator, and an independent operator, limit material input into the dissolver to less than 745 grams of U in an hour. The WI also specified the amount of H<sub>2</sub>O<sub>2</sub> input into the dissolvers, which affects IROFS CDCD-26, 27, 30, and 31. These IROFS required that the operator, and an independent operator, add the amount of H<sub>2</sub>O<sub>2</sub> listed on the work instruction. Upon implementation of the work WI, a buildup of NO<sub>x</sub> vapor in the column dissolver glove box occurred.

In accordance with the NRC Enforcement Policy, violations that are less serious, but are of more than minor concern, and that resulted in no or relatively inappreciable potential safety or security consequences are characterized as Severity Level IV violations. The failure to properly review and approve a procedure affecting management measures is a Severity Level IV violation (VIO) of NRC requirements and will be tracked as VIO 70-143/2011-003-02, Improper Use of a Work Instruction.

b. Testing of Ventilation Alarms

The inspectors evaluated the issue identified in Inspection Report 70-143/2011-006. Paragraph 2.a.(2), regarding ventilation alarms. The inspectors had identified that the licensee had not placed buildings 301 and 333 loss-of-ventilation-alarm components into the preventive maintenance program. The licensee had also not placed the building 301, building 333, and the FMF loss of ventilation alarm components into the calibration program. The licensee had entered the issue into the CAP as PIRC #28773. To address the issue, the licensee placed the applicable components into the preventive maintenance and calibration programs (tracked as Commitment/Corrective Action #14841). The inspectors evaluated the potential impact of these alarms with respect to accident sequences in the ISA. The inspectors noted that no IROFS were affected as these ventilation alarms were only associated with the "Initiating Event Failure Frequency Index Number." The accident sequences met the performance requirements even without this number. Therefore, NFS's actions with regard to this issue were adequate.

3. Event Follow-up

Event Notification: EN 46851 (NMED 110233) Shipping Container Contamination Level Exceeds Surface Contamination Limits

On May 13, NFS received a shipment of empty Type LR-230 containers from Westinghouse. The Westinghouse outgoing radiological contamination survey report that the driver delivered to NFS showed the activity levels found at all survey points to be below limits for outer surfaces of a package. As NFS personnel performed their routine receipt inspection, they identified external contamination in excess of legal limits on one of the LR-230 containers. In response, NFS personnel performed additional, more extensive contamination surveys, notified Westinghouse and the respective regulatory agencies of the survey results, and performed decontamination operations to remove the contamination from the shipping container. NRC regional inspectors followed up on the event and determined that the contamination occurred at the Westinghouse Electric Company's Columbia Fuel Fabrication Facility when approximately 2 – 3 quarts of liquid spilled inside the domed area of the container during unloading operations at that facility. Westinghouse entered the issue into its CAP. This event notification is being documented as LER 70-143/2011-003. The inspectors determined that the licensee actions were adequate. This issue is considered closed.

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 were summarized on July 13 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. PARTIAL LIST OF PERSONS CONTACTED**

<u>Name</u>	<u>Title</u>
R. Dailey	Engineering Director
R. Droke	Senior Regulatory Advisor
M. Elliott	Quality, Safety, & Safeguards Director
D. Green	President, Local 967, United Steel Workers
J. Henry	President
M. Lee	Licensing Specialist
M. Moore	Environmental Protection & Industrial Safety Section Manager
J. Nagy	Assurance Director
C. Reed	Operations Director
R. Shackelford	Nuclear Safety & Licensing Section Manager
M. Tester	Health Physics Manager
K. Weir	Security Manager
J. Wheeler	Licensing & ISA Manager

### **2. LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED**

#### Opened

70-143/2011-003-01	VIO	Failure to Maintain Configuration Control During Maintenance
70-143/2011-003-02	VIO	Improper Use of a Work Instruction

#### Opened & Closed

70-143/2011-003-03	LER	EN 46851: Shipping Container Contamination Level Exceeds Surface Contamination Limits
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#### Closed

70-143/2008-003-02	VIO	Failure To Inspect Fire Dampers
70-143/2008-004-01	VIO	Failure To Adhere To Plant Procedures
70-143/2008-004-05	URI	Verification Of IROFS Pipe Material
70-143/2009-003-01	VIO	Failure To Implement A Safety Program Required By 10 CFR 70.62 (105 lab)
70-143/2009-004	LER	EN 45497: Fire In A Process Glove Box
70-143/2009-004-01	VIO	Inadequate Design Of A System Containing SNM
70-143/2010-003-03	IFI	Lack of Radiation Protection Operating Experience Systems

Discussed

70-143/2010-002-02	VIO	Failure To Establish An Inspection Program For Sprinkler Systems Designated As IROFS
70-143-2010-003-02	VIO	Failure to Follow Procedure During SRE Testing
70-143/2010-009-01	EEI	Failure To Provide Accurate Information In A Reply To A Notice Of Violation
70-143/2010-009-02	EEI	Failure To Provide Accurate Information To NRC Inspectors

**3. INSPECTION PROCEDURES USED**

88005	Management Organization and Controls
88010	Operator Training/Retraining
88020	Operational Safety
88030	Radiation Protection
88135	Resident Inspection Program For Category I Fuel Cycle Facilities
92709	Licensee Strike Contingency Plans