



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

April 29, 2011

EN 46608

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

**SUBJECT: NRC INTEGRATED INSPECTION REPORT NO. 70-143/2011-002 AND
NOTICE OF VIOLATION**

Dear Mr. Henry:

This refers to the inspection conducted from January 1, 2011 through March 31, 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 April 4, 2011 with those members of your staff identified in the enclosed report.

This inspection 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 a Severity Level IV violation of NRC requirements occurred. The violation regards the failure of plant personnel to make proper contamination surveys before leaving the Radiation Control Area. 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.

The violation was 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 violation is cited in the enclosed Notice of Violation (Notice) and the circumstances surrounding it are described in detail in the subject inspection report. The violation is being cited in the Notice because the NRC identified the violation.

Based on the results of this inspection, the NRC has also determined that one additional Severity Level IV violation of NRC requirements occurred. This violation is being treated as a Non-Cited Violation (NCV), consistent with Section 2.3.2 of the Enforcement Policy. The NCV is described in the subject inspection report. If you contest the violation or the significance of this NCV, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-0001, with copies to: (1) the Regional Administrator, Region II; (2) the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and (3) Mr. 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 by Manuel Crespo for/

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. 70-143/2011-002

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

cc w/encls: (See page 3)

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Sincerely,

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 Fuel Facility Inspection Branch 1
 Division of Fuel Facility Inspection

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2. NRC Inspection Report No. 70-143/2011-002

cc w/encs:

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

cc w/encs: (See page 3)

PUBLICLY AVAILABLE NON-PUBLICLY AVAILABLE SENSITIVE NON-SENSITIVE

ADAMS: Yes ACCESSION NUMBER: ML111190234 SUNSI REVIEW COMPLETE

OFFICE	RII:DFFI	RII:DFFI	RII:DFFI	RII:DFFI			
SIGNATURE	/RA via email/	/RA via email/	/RA via email/	/RA via email/			
NAME	GSmith	MChitty	JPelchat	RPrince			
DATE	4/27/2011	4/27/2011	4/25/2011	4/27/2011	5/ /2011	5/ /2011	5/ /2011
E-MAIL COPY?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO

cc:

Debra Shults
Director, TN Dept. of Environment & Conservation
Electronic Mail Distribution

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Erwin, TN 37650

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

Johnny Lynch
Mayor, Town of Unicoi
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Unicoi, TN 37692

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

Letter to Joseph Henry from Steven J. Vias dated April 29, 2011

Subject: NRC INTEGRATED INSPECTION REPORT NO. 70-143/2011-002 AND
NOTICE OF VIOLATION

Distribution w/encl:

PUBLIC

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NFS Website

NOTICE OF VIOLATION

Nuclear Fuel Services, Inc.
Erwin, Tennessee

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

During an NRC inspection conducted on March 8 and 9, 2011, 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 1.5, of NFS-GH-28, "Personal Monitoring," Revision 8, requires, in part, a full survey to be performed by all personnel exiting a RCA and personnel performing a full survey will survey, at a minimum, their hands.

Section 6.6 of NFS-HS-B-31, "Performing Release Surveys," Revision 8, states in part, any item in whole or in part entering RCAs of the plant-site shall be thoroughly surveyed prior to being released from that controlled area.

Contrary to the above, on March 8, 2011:

- A. Licensee personnel exiting the RCA failed to perform a full survey. Specifically, several individuals failed to monitor their hands when exiting the RCA.
- B. Items that had been taken into the RCA were not thoroughly surveyed prior to being released from that controlled area. Specifically, two instances were observed where individuals failed to monitor hand-carried items before removing those items from the RCA.

These examples of failing to follow procedure constitute a Severity Level IV Violation (Supplement VI).

Pursuant to the provisions of 10 CFR 2.201, Nuclear Fuel Services 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 the Nuclear Fuel Services facility, 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 29th day of April 2011

U. S. NUCLEAR REGULATORY COMMISSION
REGION II

Docket No.: 70-143

License No.: SNM-124

Report No.: 70-143/2011-002

Licensee: Nuclear Fuel Services, Inc.

Facility: Erwin Facility

Location: Erwin, TN 37650

Dates: January 1, 2011 through March 31, 2011

Inspectors: G. Smith, Senior Resident Inspector
M. Chitty, Resident Inspector
R. Prince, 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 70-143/2011-002
January 1, 2011 - March 31, 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

- Required maintenance and surveillance tests for IROFS were completed prior to the startup of the ADU system. The inspectors identified a non-cited violation involving the failure to follow plant procedures while processing uranium tetrafluoride in the Building 301 column dissolvers. (Paragraph A.1.a)
- The licensee properly implemented criticality controls. (Paragraph A.2.a)
- Fire Protection equipment and barriers were adequately maintained. An emergency response exercise demonstrated the readiness of the fire brigade. (Paragraph A.3.a)

Radiological Controls

- The inspectors identified a violation when personnel exiting the RCA failed to perform the required contamination monitoring. (Paragraph B.1.a)
- Radioactive effluents were maintained within regulatory limits. (Paragraph B.2.a)

Facility Support

- Conditions adverse to safety were adequately identified, entered, and tracked in the Problem Identification, Resolution, and Correction System (PIRCS). (Paragraph C.1.a)

Attachment

Persons Contacted

List of Items Opened, Closed, and Discussed

List of Documents Reviewed

REPORT DETAILS

Summary of Plant Status

The facility began the period with the Navy fuel manufacturing facility (FMF), Uranium (U)-Aluminum, U-Oxide, U-Metal, Solvent Extraction (SX), the down-blending (DB) lines located in the Blended Low Enriched Uranium (BLEU) Preparation Facility (BPF), and the Building 301 Column Dissolvers in operation. All remaining systems located in the commercial development line of Building 301 began the period shutdown pursuant to a confirmatory action letter (CAL) issued on January 7, 2010. Following completion of the fourth restart readiness assessment which focused on the Building 301 ammonium diuranate (ADU) system (NRC Inspection Report 70-143/2010-011), restart of these operations was authorized by NRC letter on October 22, 2010. On January 13, 2011, the ADU system was restarted. All remaining systems affiliated with uranium hexafluoride located in the commercial development line of Building 301 remained in a shutdown condition pursuant to the CAL.

A. Safety Operations

1. Plant Operations (IP 88135)

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 and found no significant deficiencies in the items reviewed. 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, 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 tag-out 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.

On January 13, the inspectors observed the restart of the ADU system following a restart readiness assessment inspection that was conducted in November 2010 and documented in Inspection Report no. 70-143/2010-011. The inspectors reviewed the

post maintenance and safety related equipment tests performed prior to restart and evaluated the licensee's performance in regards to management decision-making, communications, and procedural compliance. The inspectors noted that NFS took a slow and measured approach to the start-up evolution.

On January 21, NFS began processing uranium tetrafluoride (UF_4) in the building 301 column dissolvers. Prior to this current UF_4 processing effort, these dissolvers were processing uranyl nitrate crystals. On February 8, during a routine management walk down, a senior NFS manager questioned the operators regarding the sequence of steps associated with the addition of hydrogen peroxide (H_2O_2) to the column dissolvers. The H_2O_2 is added to suppress the generation of nitrogen compound gases (NO_x). The addition of H_2O_2 is one of the IROFS for this process. The senior manager noted that the H_2O_2 was not added prior to the second material addition of UF_4 to the column dissolver as required by the licensee's procedures. Procedure SOP 409, Section 51, "Column Dissolver and Filtration," step 6.1.9 requires the addition of H_2O_2 prior to the addition of SNM which is performed in step 6.1.10. Step 6.1.9 is clearly marked as an IROFS. The senior manager quickly informed the operators of the procedural error. The issue was entered into the licensee's corrective action program (CAP) as PIRCS #28626. NFS performed an apparent cause investigation in order to understand all the causal factors leading to the error. The inspectors noted that the first material addition occurred with the proper amount of H_2O_2 . Calculations revealed that at the time of discovery, there was sufficient H_2O_2 in the dissolvers to suppress NO_x formation and that the IROFS was operable but degraded. Failure to follow plant procedures pertaining to IROFS is a violation of NRC requirements. This non-repetitive licensee-identified and corrected violation is being characterized as a Non-Cited Violation (NCV), consistent with Section 2.3.2 of the NRC Enforcement Policy and will be tracked as NCV 70-143/2011-002-01 (Failure to Add Hydrogen Peroxide to Building 301 Column Dissolvers During Dissolution Process).

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 missile hazards and missile 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 could not be 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 would degrade plant performance, the operability of IROFS, safety-related devices, or other support systems essential to safety system performance. Systems examined included:

- Building 301, ADU system
- Building 301, Exhaust Ventilation 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.

b. Conclusion

One NCV was noted for failure to follow plant procedures.

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 with the licensee implementation of criticality safety controls.

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. The inspectors also conducted fire safety tours of selected areas and observed fire brigade drills.

During the inspection period, the inspectors conducted a fire safety tour of building 440. The inspectors verified adequate control of combustible material. The inspectors walked down various fire suppression components and systems that supplied building 440 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.

On March 30, the inspectors evaluated the performance of fire brigade personnel during the conduct of an emergency response training exercise. The inspectors evaluated the readiness of personnel in responding to a large fire. The drill simulated a fire in the laboratory. The inspectors observed fire brigade members using protective clothing, turnout gear, and self-contained breathing apparatuses while entering the area. The inspectors noted that fire brigade members entered the area in a controlled manner. The inspectors also noted that fire-fighting equipment brought to the fire scene had been adequately maintained and was used appropriately and effectively to control and extinguish the simulated fire. The inspectors noted that medical and radiological control personnel responded to simulated acid burn victims and that simulated potentially contaminated burn victims were treated, decontaminated, and/or transported to a local hospital as appropriate. The inspectors observed the efforts to combat the fire and monitored the communications between fire brigade members and the incident commander. The inspectors noted that off site assistance was requested and that the Erwin Fire Department responded in a timely manner. The incident commander displayed sufficient command and control and adequately coordinated the fire-fighting efforts of site fire brigade personnel and the Erwin Fire Department. The inspector verified that the pre-planned drill scenario was followed and reviewed the results of the post drill critique to determine if drill objectives were satisfied and that drill weaknesses were adequately captured and discussed.

b. Conclusion

No findings of significance were identified with regard to fire protection equipment and the readiness of the fire brigade.

B. Radiological Controls1. 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 RWPs. The inspectors also noted that radiation area postings complied with plant procedures and included radiation maps with up-to-date radiation levels. The inspectors monitored the operation of radiation protection instruments and reviewed the calibration due dates of those instruments. Radiation work permits were adequately developed and implemented in order to ensure personnel exposure was maintained as low as reasonably achievable (ALARA).

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

- On January 12, inspectors performed a review of SWP #14264 which was issued to repair/replace o-rings and valves per work request #143367 in the building 301 ADU processing area.
- On January 21, inspectors performed a review of SWP #14287 which was issued to remove and replace items for calibration under work order #123537.
- On February 23, inspectors performed a review of SWP #11-39-004 which was issued to repair/replace a pump in the building 301 column dissolver processing area under work orders #151327 and #151314.

During observation of radiation monitoring activities performed on March 8, the inspectors noted that personnel exiting the RCA did not perform the required contamination monitoring. Section 1.5, of NFS procedure NFS-GH-28, "Personal Monitoring," Revision 8, requires that a full survey be performed by all personnel exiting a RCA and that personnel performing a full survey will survey at a minimum their hands. Section 6.6 of NFS procedure NFS-HS-B-31, "Performing Release Surveys," Revision 8, requires any item entering radiologically controlled areas of the plant-site shall be thoroughly surveyed prior to being released from that controlled area.

Two incidents were observed where individuals failed to monitor hand carried items upon exit from the RCA. Several individuals failed to monitor their hands prior to exiting the RCA. These infractions were contrary to the requirements of the procedures cited above. Additionally, posted instructions at the exit point clearly required the monitoring

of hands, feet, and legs (if smocks are worn) and required the surveying of all hand carried items. In addition, some individuals demonstrated improper monitoring techniques involving improper location and rate of movement of the contamination monitoring detector while surveying for contamination.

As a result of the infractions identified above, the inspector reviewed radiological survey records for surveys performed outside of the Material Access Area (MAA) covering a several week period. The records were reviewed for completeness and accuracy and included the results of surveys made in the clean side locker room, change room facilities and lunch areas. In addition the inspector noted that the licensee performs random personnel surveys on a routine basis of individuals outside of the MAA. Based on a review of records and discussions with licensee personnel the inspector found that adequate measures had been established to monitor for the presence of contamination in areas outside of the MAA. The inspector determined that no spread of contamination had occurred.

The licensee entered the issue into the CAP as PIRCS item # 29056. Failure to perform personnel contamination surveys as required by plant procedures was identified as a violation (VIO) of NRC requirements and will be tracked as VIO 70-143/2011-002-02 (Failure to Perform Required Personal Monitoring Upon Exit From the Radiologically Controlled Area).

b. Conclusion

Inspectors identified one violation of NRC requirements regarding the failure to properly perform personal contamination monitoring.

2. Effluent Control and Environmental Protection

a. Inspection Scope and Observations

The inspectors reviewed results of liquid and gaseous effluent measurements to determine if any action levels were exceeded, and if so, evaluate the licensee's corrective actions. On February 22, 2011, the licensee issued its Biannual Effluent Monitoring Report for the period July through December of 2010. The inspectors performed a review of this report which is broken down into radioactive liquid and gaseous effluents. The liquid effluents from NFS originate from three sources; BLEU sewer, main sewer, and the waste water treatment facility (WWTF). All three liquid effluent sources were well below the limits prescribed in 10 CFR 20 Appendix B. The highest source was from the WWTF which was measured at slightly less than 30% of the Appendix B limits.

The inspectors noted that NFS changed their process for developing this report in that negative values for radioactivity measurements were set to a value of '0' and not recorded as negative values. The use of negative values was addressed in Inspector Follow-up Item (IFI)-70-143/2010-004-01. In December 2010, Regulatory Guide 4.16, "Monitoring and Reporting Radioactive Materials in Liquid and Gaseous Effluents from Nuclear Fuel Cycle Facilities" was revised. Section 6.5 of the revised version of RG 4.16 states:

“While there is value in obtaining analytical results that are less than zero for internal use, this practice may introduce confusion when summarizing data during preparation of semiannual (or annual) reports for external use (e.g., reports for regulators or the public). When preparing summary reports for external use, effluent estimates may be based on statistically few samples or may be applied to estimating exposures of relatively short duration. Use of negative analytical data in summarizing effluents could result in an estimate for releases and exposure that is less than zero. This can be misleading and should be avoided. Summary information reported to the NRC should substitute ‘0’ for any negative analytical values obtained from analysis of samples and should be accompanied by a footnote indicating that a value of ‘0’ was substituted for negative analytical results (or other appropriate verbiage).”

While the prior practice of reporting negative values was statistically sound and did not violate any NRC requirement, NFS’ procedure amendment to use zero was more conservative and provides a higher level of protection in the future. As discussed in Paragraph D.1.a, based on the above and NFS’ elimination of the use of negative values in effluent reports, IFI-70-143/2010-004-01 is considered closed.

The gaseous effluents were reported for the 20 operating exhaust stacks on site. The inspectors noted that the effluent concentration values were exceeded on the following five stacks: main plant stack 416, building 330 stack 327, building 100 stack 421, building 110 stack 600, and building 301 stack 774. In accordance with 10 CFR 20.1302, a licensee must show compliance with dose limits to the general public by either showing compliance with 10 CFR 20 Appendix B or by demonstrating that the worst case total effective dose to an individual at the site boundary does not exceed the annual dose limit of 100 millirem. NFS chose the latter regulatory option and used the Department of Energy’s CAP88-PC computer program to calculate the worst case total effective dose to an individual at the site boundary. The licensee’s calculation determined that the maximum exposed individual would receive a total effective dose equivalent of 0.0044 millirem. This value is well below the federal annual dose limit of 100 millirem specified in 10 CFR 20.1301.

c. Conclusions

No findings of significance were identified with the licensee’s radioactive effluents.

C. Facility Support

1. Maintenance/Surveillance (IP 88135)

a. Inspection Scope and Observations

The inspectors reviewed work requests and a sample of the corrective action program 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 three 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.

b. Conclusions

No findings of significance were identified with the licensee's identification, entry and tracking of conditions adverse to safety in the corrective action program.

D. Special Topics

1. Follow-up on Previously Identified Issues

a. IFI-70-143/2010-004-01: Use of Negative Effluent Concentration Values in the Sum of Fractions Portion of the Semi-Annual Effluent Reports.

The inspectors noted that NFS changed their process for developing this report in that negative values for radioactivity measurements were set to a value of '0' and not recorded as negative values. This change was compatible with the December 2010 revision of Regulatory Guide 4.16, "Monitoring and Reporting Radioactive Materials in Liquid and Gaseous Effluents from Nuclear Fuel Cycle Facilities"

While the prior practice of reporting negative values was statistically sound and did not violate any NRC requirement, NFS' procedure amendment to use zero was more conservative and provides a higher level of protection in the future. Based on the above and NFS' elimination of the use of negative values in effluent reports, IFI-70-143/2010-004-01 is considered closed.

b. URI-70-143/2010-004-02; Lack of Updates to the Isotopic Ratio Technical Basis Document Used to Assess Stack Effluent Releases.

NFS issued Revision 8 to the basis document on January 25, 2011. The inspectors reviewed the document and determined that the revision addressed, among other issues, the building 301 stack and formally documented the measured isotopic ratios. NFS also established a validation frequency for the basis document. URI-70-143/2010-004-02 is considered closed.

c. IFI 70-143/2007-008-05: Use of Unverified and Unvalidated Third Party Software for Analysis of Sampling Results

The inspectors reviewed NFS work plan DC-WP-001, "Decommissioning Environmental Department MACTEC Subsurface Soil Characterization Software Verification and Validation Work Plan." The inspectors also reviewed the verification and validation of the third-party software used with sampling results. This review included a check of calculations for accuracy, functionality and release failure criteria. The inspectors had no further questions regarding IFI 70-143/2007-008-05. This item is considered closed.

2. Event Follow-up

a. Event Notification: EN 46608 Material Control and Accountability (MC&A) Alarm Resolution

This item was reviewed and closed in the MC&A inspection report (Inspection Report no. 70-143/2011-201) dated April 6, 2011.

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 April 4 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. LIST OF PERSONS CONTACTED

G. Athon, Jr., Principal Scientist
C. Brown, Material Control & Accountability Section Manager
T. Coates, Electrical & Instrumentation Engineering Section Manager
R. Dailey, Engineering Director
G. Darter, Program Management Director
R. Droke, Senior Regulatory Advisor
M. Elliott, Quality, Safety, & Safeguards Director
K. Engle, Work Management Section Manager
J. Henry, President
R. Holley, Manager Environmental Protection
M. Lee, Safety Analysis Specialist
M. Moore, Environmental Protection & Industrial Safety Section Manager
J. Nagy, Assurance Director
R. Shackelford, Nuclear Safety & Licensing Section Manager
M. Tester, Radiation Protection Unit Manager
J. Wheeler, Licensing & ISA Manager

Other licensee employees contacted included engineers, operators, and technicians.

2. LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

<u>Item Number</u>	<u>Status</u>	<u>Description</u>
70-143/2011-002-01	Opened	NCV - Failure to Add Hydrogen Peroxide to Building 301 Column Dissolvers During Dissolution Process
70-143/2011-002-02	Opened	NOV - Failure to Perform Required Personal Monitoring Upon Exit From the Radiologically Controlled Area
70-143/2007-008-05	Closed	URI - Review of NFS' Verification and Validation of Software Used For Decommissioning
70-143/2010-004-01	Closed	IFI - Negative Values Used In Semi-Annual Effluent Report
70-143/2010-004-02	Closed	URI - Technical Basis Document for Plant Stack Isotopic Ratios Not Updated

3. INSPECTION PROCEDURE USED

IP 88135 Resident Inspection Program For Category I Fuel Cycle Facilities