



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

July 29, 2010

Mr. David B. Amerine
President
Nuclear Fuel Services, Inc.
P. O. Box 337, MS 123
Erwin, TN 37650

SUBJECT: NRC INSPECTION REPORT NO. 70-143/2010-002 AND NOTICE OF VIOLATION

Dear Mr. Amerine:

This letter refers to the inspections conducted from April 1, 2010 to June 30, 2010, at the Nuclear Fuel Services (NFS) facility in Erwin, TN. The purpose of these inspections was to determine whether activities authorized under the license were conducted safely and in accordance with NRC requirements. At the conclusion of the inspections, the findings were discussed on July 7th with those members of your staff identified in the enclosed report.

The inspections consisted of an examination of activities conducted under the license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of the license. Areas examined during the 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 these inspections, the NRC has determined that one Severity Level IV violation of NRC requirements occurred. This violation was evaluated in accordance with the NRC Enforcement Policy included on the NRC's Web site at <http://www.nrc.gov/about-nrc/regulatory/enforcement/enforce-pol.html>.

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

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

In addition to the violation discussed above, a violation was also identified and treated as a Non-Cited Violation (NCV), consistent with Section VI.A of the Enforcement Policy.

The NCV is described in the subject inspection report. If you contest the violation or the significance of the NCV, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-0001, with copies to: (1) the Regional Administrator, Region; (2) the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC, and (3) the NRC Senior Resident Inspector at your 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: Notice of Violation
NRC Inspection Report No. 70-143/2010-002

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PUBLICLY AVAILABLE NON-PUBLICLY AVAILABLE SENSITIVE NON-SENSITIVE

ADAMS: Yes ACCESSION NUMBER: _____

SUNSI REVIEW COMPLETE

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SIGNATURE	Via email		Via email		Via email	
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DATE	8/ /2010	8/ /2010	8/ /2010	8/ /2010	8/ /2010	8/ /2010
E-MAIL COPY?	YES NO	YES NO	YES NO	YES NO	YES X NO	YES NO

NOTICE OF VIOLATION

Nuclear Fuel Services, Inc.
Erwin, Tennessee

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

During an NRC inspection conducted from May 24 - 28, 2010, a violation of NRC requirements was identified. In accordance with the NRC Enforcement Policy, the violation is listed below:

10 CFR 70.62 requires, in part, that each licensee shall establish a safety program that demonstrates compliance with the performance requirements. One of the elements of the safety program is management measures.

10 CFR 70.62(d) requires, in part, that each licensee shall establish management measures to ensure compliance with the performance requirements. These measures shall ensure that engineered Items Relied on for Safety (IROFS) will be available and reliable to perform their intended function when needed, to comply with the performance requirements.

Contrary to the above, prior to May 28, 2010, the licensee failed to establish a safety program that would ensure that an engineered IROFS would be available and reliable to perform its intended function when needed, to comply with the performance requirements. Specifically, the licensee's inspection, testing, and maintenance program did not have requirements for inspecting the wet-pipe sprinkler systems designated as IROFS as required by NFPA 25. The affected IROFS included FIRE-9, FIRE-10, FIRE-12, FIRE-15 and FIRE-32. The inspectors determined that due to the lack of inspection the licensee did not identify that the sprinklers designated as IROFS were in a degraded condition. The degraded condition consisted of the following: 1) inadequate sprinkler coverage per fire area, 2) inadequate distance between sprinklers, 3) inadequate distance between sprinkler heads and the adjacent wall, and 4) excessive area of protection per sprinkler.

This is a Severity Level IV Violation (Supplement VI)

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.

Dated this 29th of July, 2010

U. S. Nuclear Regulatory Commission
Region II

Docket No.: 70-143

License No.: SNM-124

Report No.: 70-143/2010-002

Licensee: Nuclear Fuel Services, Inc.

Facility: Erwin Facility

Location: Erwin, TN 37650

Dates: April 1, 2010 – June 30, 2010

Inspectors: G. Smith, Senior Resident Inspector
M. Chitty, Resident Inspector
M. Crespo, Senior Fuel Facility Inspector
O. Lopez, Fuel Facility Inspector
S. Subosits, Senior Resident Inspector

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

Enclosure

EXECUTIVE SUMMARY

Nuclear Fuel Services, Inc.
NRC Integrated Inspection Report 70-143/2010-002
April 1 – June 30, 2010

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 was 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 activities were performed safely and in accordance with approved procedures. (Paragraph 2.a)
- Criticality station limit cards were followed by licensee personnel. However, a non-cited violation was identified for a failure to follow a criticality safety procedure. (Paragraph 2.b)
- The inspectors identified one violation that dealt with the failure to perform required inspections of a sprinkler system that was deemed an IROFS. (Paragraph 2.c)

Radiological Controls

- Radiation work permits were adequately developed and implemented in order to ensure personnel exposure was kept as low as reasonably achievable. (Paragraph 3)

Facility Support

- Required surveillance tests for IROFS were completed prior to the startup of the Uranium-Oxide system. (Paragraph 4.a)
- Plant modifications were implemented in accordance with approved plant procedures. (Paragraph 4.b)
- Adverse conditions were sufficiently identified and tracked to completion. (Paragraph 4.c)

Attachment
Supplementary Information

REPORT DETAILS

1. Summary of Plant Status

The facility began the period with all operating areas shutdown with the exception of the Navy fuel manufacturing facility (FMF) which was authorized to restart operations on March 23rd following completion of the NRC's restart readiness assessment (NRC Inspection Report 70-143/2010-005). All operations had previously been shutdown pursuant to a confirmatory action letter (CAL) issued on January 7, 2010. Operations continued solely in the FMF until May 19 when the NRC authorized restart of the Uranium (U)-Oxide, U-Metal, Solvent Extraction (SX), and down-blending (DB) lines located in the Blended Low Enriched Uranium (BLEU) Preparation Facility (BPF). This restart was authorized following the completion of the second phase of the NRC's restart readiness assessment (Inspection report 70-143/2010-006). The FMF, U-Oxide, U-Metal, SX and DB lines continued operation until the end of the period. U-Aluminum, and all systems located in the commercial development line (Building 301) remained in a shutdown condition pursuant to the CAL.

2. Safety Operations

a. Plant Operations (88135)

(1) Inspection Scope and Observations

Operating Area Observations

The inspectors performed daily tours of the plant operating areas and determined that equipment and systems were operated safely and in compliance with the license. Daily operational meetings 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 (valves, sensors, instrumentation, in-line monitors, scales, etc) and 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, including the status of various alarms and annunciators. The activities observed by inspectors during normal and upset conditions were performed in compliance with procedures and station limits. The inspectors noted that safety controls were in place and were being controlled with supervision. The inspectors verified the adequacy of communications between supervisors and operators within the operating areas. The inspectors walked down sections of the standard operating procedures and verified that IROFS were identified and operable in each of the areas. The inspectors reviewed log books, lockout tag-out records, and Letters of Authorization (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.

Plant Tours

The inspectors performed periodic tours of out-lying facility areas during the inspection period and determined that equipment and systems were operated safely and in compliance with the license. The focus of these tours centered around the evaluation of potential missile hazards and missile protection features, combustible material storage and fire loading, hazardous chemical storage, 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.

Plan-of-the-Day-Meeting.

The inspectors attended various plan-of the-day meetings throughout the inspection period in order to determine the overall status of the plant. The inspectors evaluated the adequacy of the licensee's response to significant plant issues as well as their approach to solving various plant problems.

Safety-Significant System Walk-down

During the inspection period, the inspectors performed a walk-down of safety significant systems involved with the processing of special nuclear material (SNM). As part of the walk-down, the 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 systems as well as the IROFS and IROFS instrumentation for maintaining plant safety. The inspectors also verified that these assumptions and controls were properly implemented in the field. The inspectors reviewed the related Integrated Safety Analysis (ISA) to verify the system's ability to perform its functions could not be affected by outstanding design issues, temporary modifications, operator workarounds, adverse conditions, or other system-related issues tracked by the engineering department. 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. Examined systems included:

- U-Oxide system
- Area 200

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:

- Valves were correctly positioned and did not exhibit leakage that would impact the function of any given valve;
- 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.

(2) Conclusions

No findings of significance were identified.

b. Criticality Safety (88135)

(1) 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.

On May 26, an NFS engineer noted that contaminated trash item used to clean up Area 200 was placed in a large volume waste bag. This is contrary to procedure NFS NFS-HS-CL-10, "Nuclear Criticality Safety – Fuel Manufacturing Facility," Rev. 24. This procedure requires that trash essentially be stored in 2 liter bottles to ensure a favorable geometry. The trash item was accidentally rolled into the workers glove and then placed in an unfavorable geometry waste bag. The glove was ultimately retrieved and disposed of in accordance with NFS-HS-CL-10. NFS entered the issue into the corrective action program (CAP) as Problem Identification, Resolution and Correction System (PIRCS) item #24817. Failure to follow criticality safety procedures is a violation of NRC requirements. This non-repetitive, licensee-identified and corrected violation is being treated as a non-cited violation (NCV), consistent with Section VI.A.8 of the NRC Enforcement Policy and is identified as NCV 70-143/2010-002-01, "Failure to Comply with Criticality Safety Procedures".

(2) Conclusions

One NCV was identified for failure to follow criticality safety procedures.

c. Fire Protection

Routine Fire Inspection (IP 88135)

(1) 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 building 306. The inspectors verified adequate control of combustible material. The inspectors walked down various fire suppression components and systems that supplied building 306 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.

(2) Conclusions

No findings of significance were identified.

Annual and Triennial Fire Protection Inspections (IP 88054 and 88055)

(1) Inspection Scope and Observations

The inspections focused on the FMF, Building 440, and the BPF solvent extraction process. The inspectors reviewed the facilities' fire hazard analyses to verify that each analysis considered the effects of fires with respect to: safety controls, suppression activities on process areas, a malfunction of an automatic fire protection system, the potential for spread of contamination, transient combustibles, the response of the offsite fire department and the onsite fire brigade.

The inspectors verified that flammable materials were stored in marked cabinets as specified in approved procedures and that housekeeping and the control of combustible materials (IROFS FIRE-2) was adequate and consistent with the approved procedures. The inspectors reviewed a sample of IROFS FIRE-2 monthly surveillances and hot work permits. The inspectors determined that the surveillances and hot work permits were performed and implemented in accordance with procedures.

The inspectors reviewed pre-fire plans and determined that the pre-fire plans contained sufficient information to support the response of the facility's emergency response team and offsite fire department.

The inspectors reviewed the material condition, operational lineup, and design of fire suppression systems. The inspectors verified that sprinklers and carbon dioxide (CO₂) discharge nozzles were not obstructed, that spacing requirements were met, and that the water and CO₂ supply to each of the systems was readily available. The inspectors also reviewed the inspection, testing, and maintenance requirements of fire suppression systems to verify that the systems were reliable and available. The review included the

following systems: Building 302 CO₂ suppression system (IROFS FIRE-1), 306 East Building wet-pipe sprinkler (IROFS FIRE-32 and FIRE-12), Building 304 wet-pipe sprinkler (IROFS FIRE-9 and FIRE-10) and Bldg 440 dry-pipe sprinkler system.

The inspectors noted that the licensee's inspection, testing, and maintenance program did not have requirements for inspecting the wet-pipe sprinkler systems designated as IROFS as required by National Fire Protection Association (NFPA) 25, "Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems." The affected IROFS included FIRE-9, FIRE-10, FIRE-12, FIRE-15 and FIRE-32. The inspectors identified that the sprinklers associated with FIRE-9, FIRE-10, FIRE-12, FIRE-15 and FIRE-32 were in a degraded condition. The degraded condition consisted of 1) inadequate sprinkler coverage per fire area, 2) inadequate distance between sprinklers, 3) inadequate distance between sprinklers and the adjacent wall, and 4) excessive area of protection per sprinkler. The inspectors determined that the degraded condition of the sprinklers was due to the licensee's failure to inspect, test, and maintain the sprinklers in accordance with the requirements of NFPA 25. Following the identification of the issue, the licensee performed an assessment of the adequacy of the sprinklers and determined that the system would successfully mitigate a fire. The inspectors independently assessed the sprinkler system and reached the same determination. However, Title 10 Code of Federal Regulations (CFR) 70.62 requires, in part, that each licensee shall establish a safety program that demonstrates compliance with the performance requirements. One of the elements of the safety program is management measures. 10 CFR 70.62(d) requires, in part, that each licensee shall establish management measures to ensure compliance with the performance requirements. These measures shall ensure that IROFS will be available and reliable to perform their intended function when needed. Failure to establish an inspection program for sprinkler systems designated as IROFS constitutes a violation (VIO) of NRC requirements and is identified as VIO 70-143/2010-02-02, "Failure to establish an inspection program for sprinkler systems designated as IROFS".

The inspectors noted that the licensee initiated an assessment 21T-10-0409, "Fire Protection Program Assessment," (tracked under PIRCS item #24789) of the fire protection program. As a result of the licensee's assessment findings, the licensee initiated a project to disposition open recommendations identified in the licensee's Fire Hazard Analysis (FHA). The licensee stated that the open recommendations will be validated, prioritized, and corrected. The licensee addressed open recommendations in process areas covered by the ISA. The licensee committed to correct the following open recommendations: 1) upgrade the building 304 breezeway sprinkler, 2) remove the combustible roofing in sections of building 302, 3) replace the fire doors in the 300 complex, and 4) upgrade the building 304 combustible gas detection system. The licensee also committed to revise the FHAs to ensure that they reflect the actual facility configuration. Although some of the FHAs' open recommendations were not in compliance with NFPA code requirements, the inspectors determined that the affected fire protection systems were able to perform their intended safety function. In addition, the licensee initiated a fire door replacement plan for the fire doors in the materials processing area to bring all the fire doors into compliance with NFPA 80.

The inspectors noted that one open FHA recommended removing a highly-combustible tar mezzanine roof cover in the tube cleaning room (TCR). The inspectors noted that the licensee determined that a fire in the TCR could result in a chemical intermediate consequence event to the public. The licensee credited control of combustibles, IROFS FIRE-2, as a sole IROFS for this accident sequence. The inspectors noted that FIRE-2 did not include inspection of the tar mezzanine roof cover. The inspectors questioned whether the additional combustible loading provided by the tar roof was accounted for in the consequence analysis and what would be the consequence of a fire that started in the TCR roof. This issue will be tracked as unresolved item (URI) 70-143/2010-002-03, "Evaluation of combustible loading of Tube Cleaning Room due to tar roof and resulting consequence evaluation", pending review of the licensee's consequence analyses that includes the additional combustible loading provided by the tar roof and subsequent consequence of a roof fire in the TCR.

The inspectors reviewed the ISA to verify that credible fire related scenarios were identified. The inspectors identified a fire accident sequence in the BPF SX system that could result in an intermediate consequence event as defined in 10 CFR 70.61. The licensee's evaluation concluded that the initiating event, a fire that causes a solvent release and ignites the solvent, for the accident sequence was "unlikely," and therefore they were in compliance without the need to implement IROFS. Specifically, the licensee assigned an initiating event of -1 (which is defined as "expected to occur during plant life") to a fire that results in a release of solvent and an enabling event of -2 (which is defined as "not expected, but might occur during plant lifetime") to the likelihood that solvent is ignited and continues to burn. The inspectors determined that the licensee's basis for determining that the event was unlikely lacked the supporting data to justify the assigned probability. The licensee credited the ignition characteristics (flash point) of the solvent as an enabling event to reduce the likelihood of solvent ignition. The licensee based this likelihood on a solvent ignition sensitivity test performed on April 4, 2002. However, the licensee did not have a documented test plan that described the conditions under which the test was performed, or whether the ignition sources used were representative of all potential ignition sources that could be present in the solvent extraction process area. The inspectors determined that an enabling event frequency of -2 was not appropriate because the licensee did not have the technical basis to support the assigned enabling event frequency. At the time of the inspection, the licensee did not have sufficient information to support the assigned enabling event frequency. As an immediate corrective action, the licensee identified the control of combustibles in the solvent extraction process area as an additional IROFS to reduce the likelihood of a fire that causes a solvent release and ignites the solvent. This issue will be tracked as URI 70-143/2010-002-04, "Evaluation of analysis supporting "unlikely" probability of fire in solvent extraction area", pending the review of the licensee's analysis regarding the justification for an enabling event frequency of -2 associated with the likelihood that the solvent is ignited and continues to burn.

The inspectors performed walk-downs of production areas and laboratories to evaluate the presence, adequacy, and condition of active heat/smoke detection equipment relative to the requirements of NFPA 72, "National Fire Alarm Code." The inspectors also evaluated the licensee's performance associated with inspection, testing, and maintenance of the detection systems. The areas targeted for review included all the 300-series production areas, the 105 Laboratory, associated offices and utility

equipment rooms, the building 440 process areas, the 306 and 480 equipment rooms, and the 105 criticality detector/public address equipment room. The production facilities were equipped with a variety of heat/smoke sensors including independent spot-type heat/smoke/combination sensors, projected beam smoke sensors, air sampling smoke sensors, and linear heat detection cable sensors. The majority of detector sensors and manual pull stations were connected to intermediate detector panels and ultimately networked to Class A supervisory fire control system. An independent 302/303 fire detection and carbon dioxide extinguishing system was equipped with an independent heat detector network. The inspectors evaluated a large sample of fire detection systems for compliance with NFPA 72 and manufacturer requirements for area coverage, mounting heights, and potential interferences that could inhibit device functionality. A sample of heat/smoke and hydrogen detectors were compared to the licensee's as-built drawings in the 300 production areas including: 1) the 302/303 production facility smoke detector installation, drawing 013-E0070, 2) the 303 Area 600 smoke detection system, drawing 303-E0209-D, 3) the 303 area 900 smoke detection system, drawing 303-E0211-D, 4) the 304 fire protection-smoke detector installation, drawing 304-E0071-D, and 5) the 304 area L beam type smoke detector, drawing 307-E3021. The inspectors followed up on a fault indication noted on the building 105 fire display panel. Licensee personnel stated that they were aware of the fault and had entered the event into the corrective action system and a work request had been generated. The inspectors reviewed the corrective action system entry, PIRCS item #24636, and the work request, #144278.

The inspectors reviewed surveillance inspection and testing records to determine compliance with licensee procedures and compliance with NFPA 72 testing frequencies listed in Table 10.4.4. The review included samples of recently completed surveillance criticality/fire/alarm tests and the resulting records (form HS 184). Samples of maintenance surveillance records and procedures were evaluated for compliance with NFPA 72 inspection, testing, and maintenance protocols. The inspectors reviewed other surveillance records including testing of manual pull stations, emergency lights, fire trace inspection, annual smoke detector tests, and annual beam detector tests.

The inspectors evaluated the adequacy of alarm devices and public address equipment relative to the requirements of NFPA 72, National Fire Alarm Code. The evaluation included the review of audible and visual alarm devices located in the targeted production facilities. The licensee's audio devices consisted of various sizes and power ratings of speakers relative to aerial coverage. The speakers were located in individual equipment rooms and offices. Multiple speaker systems were located in large rooms and exterior environments. Visual alarm devices included strobe lights and flashing lights.

The inspectors evaluated communications systems that would be used by Emergency Response personnel during a fire-related event. The licensee's communications program consisted of cell phones and pre-staged 2-way radios. The inspectors noted that past Emergency Response drills had exposed limitations on cell phones and 2-way radios when used deep within buildings. Cell phone performance had been improved by the installation of bi-directional amplifiers within and around large buildings. The 2-way radio weaknesses had been recorded in the licensee's correction action program as PIRCS item #20792 and the licensee had initiated replacing 2-way radios with more

powerful units. The emergency response director provided a copy of purchase order #170491 for the purchase of higher power 2-way radios to replace the existing lower power radios. Inspectors also reviewed a previous communications test record and confirmed the test had been conducted in accordance with the procedure.

The inspectors performed walk downs of production, laboratory, and other related areas to evaluate the adequacy, condition, and effectiveness of emergency lighting relative to the requirements of Chapter 7 of NFPA 101, "Life Safety Code." The inspectors also evaluated the licensee's performance of testing and maintenance of emergency lights by reviewing surveillance records as specified by procedure NFS-HS-B-11, "Inspection of Emergency Lights," Rev. 7.

The inspectors conducted walk-downs of the accessible portions of risk significant fire areas. 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 verified that penetrations in fire-rated walls were properly sealed. The inspectors also reviewed the licensee's inspection records for portable fire extinguishers, fire hoses, and fire doors. The inspectors noted that the licensee had modified the fire door inspection procedure to require the industrial safety specialist to conduct the inspections rather than the first line supervisors who had conducted previous inspections. The following areas were evaluated:

- Building 306;
- The material processing area; and
- The 105 Laboratory.

(2) Conclusions

One violation was identified for failure to provide adequate management measures associated with IROFS.

3. Radiological Controls

Radiation Protection (88135)

(1) Inspection Scope and Observations

During tours of the production areas, the inspectors verified workers complied with health physics procedures. The inspectors noted that plant workers properly wore dosimetry, used protective clothing in accordance with applicable Radiological Work Permits (RWPs), and properly frisked upon exiting the controlled area. The inspectors 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.

On April 12, the inspectors performed a detailed review of Safety Work Permit (SWP) #13370. This SWP included radiological requirements detailed under the RWP section. The work was performed in accordance with LOA-MISC-10-0022, "Examination, Sampling, and Cleaning of BPF Process Ventilation Ductwork," which involved the internal inspection of ventilation ductwork located in building 333. The inspectors verified that craft personnel complied with the prescribed controls and precautions. The inspectors noted that the RWP contained adequate requirements concerning the radiation levels, respiratory equipment, dosimetry, contamination levels, special tools and equipment, airborne radioactivity, and containment devices. The area was effectively controlled by health physics personnel. The SWP was prominently posted for employees' review and observation. Workers entering the SWP area signed onto the SWP, verifying their knowledge of the entry requirements.

(2) Conclusions

No findings of significance were identified.

4. Facility Support

a. Maintenance/Surveillance (IP 88135)

(1) Inspection Scope and Observations

The inspectors performed a detailed review of the SRE Test database prior to startup of the U-Oxide and U-Metal systems which were granted restart authorization by the NRC on May 19, 2010. The inspectors verified that required IROFS for the U-Oxide and U-Metal were properly tested prior to system startup.

(2) Conclusions

No findings of significance were identified.

b. Permanent Plant Modifications (IP 88135)

(1) Inspection Scope and Observations

The inspectors reviewed a modification to the BPF Solvent Extraction system. The inspectors evaluated Technology Review (TR), TR-10-005, CEA-10-073, for compliance with plant procedure, NFS-TS-009, "Configuration Management of Process Change." The inspectors reviewed the NFS laboratory studies and associated Enterprise Change Request (ECR) documentation. The inspectors determined that the technology review thoroughly identified risks associated with the process change. NFS-TS-009 requires identification of risks in four categories: safety, compliance, quality and cost. The inspectors noted that the review identified 24 risks in total. Fifteen of the risks were associated with safety, and the remainder were related to compliance, quality or cost. The inspectors performed a detailed review of two of the 24 risk mitigation requirements. The inspectors also evaluated the adequacy and ability of "in place" process control equipment to remove heat generated during the raffinate solidification process. The

inspectors also reviewed the laboratory study for testing of SNM with ferrous sulfamate (FS) to verify that the licensee had adequately assessed the potential for unexpected chemical reactions with FS. The inspectors noted that neither the generation of nitrogen compound gases nor other unexpected reactions occurred in the laboratory tests related to solvent extraction processing with FS. The inspectors also reviewed procedure changes and operator training associated with the introduction of FS into the SX process.

(2) Conclusions

No findings of significance were identified.

c. Management Organization and Controls (IP 88135)

(1) Inspection Scope and Observations

The inspectors reviewed the licensee's CAP to ensure that items adverse to safety were being identified and tracked to closure. 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 PIRCS.

(2) Conclusions

No findings of significance were identified.

5. Follow-up on Previously Identified Issues

a) (Closed) IFI 70-143/2007-004-02, Incorrectly Designed Check Valve for Application.

This IFI was opened due to an apparent lack of an adequate evaluation associated with the discovery of an installed check valve in Building 302 that did not meet the specified design requirements. Specifically, the installed check valve had a cracking pressure lower than specified in the design documents. The valve was replaced with the correct valve under Work Request #115193. Following discussions with the licensee personnel, the issue was entered into the CAP program as PIRCS #10522. Several corrective actions were completed including a detailed engineering analysis (PIRCS investigation #4617) regarding the potential risks associated with the incorrectly installed check valve. The inspectors reviewed the licensee's analysis and corrective actions and determined that the performance requirements of 10CFR 70.61 would have been met regardless if the incorrectly designed valve was installed in the system.

b) (Closed) VIO 70-143/2008-002-01, Failure To Perform Plant Modifications In Accordance With 10CFR70.72.

The licensee failed to document the technical basis for three plant modifications. The inspectors noted a general lack of rigor and in some cases a total lack of a written technical basis for plant modifications. The inspectors reviewed the

licensee's response to this violation issued on September 3, 2008 and as well as the associated corrective actions from PIRCS item #14766. Due to on-going configuration program changes in 2009, the violation remained open to verify that the configuration program changes would have a positive impact on the quality of plant modifications. Following the bowl cleaning station event on Oct 13, 2009 (see Augmented Inspection Team Report 70-143/2009-011), significant program changes occurred regarding the implementation of plant modifications. The issues identified and tracked in inspection report 70-143/2009-011 will sufficiently track the weaknesses that were documented under this violation.

- c) (Closed) URI 70-143/2009-003-02, Analysis of Fire in Building 105, and 70-143/2009-003-03, Implementation of Recommendations of Fire Hazard Analysis.

The licensee performed an analysis to evaluate the consequences of a fire in the 105 Laboratory. The licensee modeled the fire as a free burning fire and the sprinkler system was not credited. The licensee determined that due to the low inventory (actual and historical) of chemicals, radioactive materials, and combustible materials in the 105 Laboratory, the consequence of a fire to the public and the environment would be low. NRC fire protection engineers independently verified that the calculations accurately reflected the potential consequences from a fire in the 105 Laboratory. The NRC determined that a fire in the Building 105 Laboratory would appropriately be characterized as a low consequence event as defined in 10 CFR 70.61. Therefore, the licensee met the performance requirements. Regardless, the licensee expanded the application/inspection of control of combustibles, IROFS FIRE-2, into the 105 Laboratory to further reduce the likelihood of a significant fire. In addition, the licensee committed to bring the Building 105 sprinkler system into compliance with NFPA 13 (2010 edition). The licensee stated that the sprinkler upgrade project would be completed on December 2010.

6. 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 7, 2010 with the licensee's management. No dissenting comments were received from the licensee. Proprietary information was discussed but not included in the report.

SUPPLEMENTARY INFORMATION

Key Points of Contact

<u>Name</u>	<u>Title</u>
David Amerine	President
Clayton Brown	Material Control & Accountability Section Manager
Ron Dailey	Engineering Director
Gary Darter	Program Management Director
Rik Droke	Regulatory Advisor Senior
Mark Elliott	Quality, Safety, & Safeguards Director
Kenneth Engle	Work Management Section Manager
Tim Lindstrom	Vice President Operations
John Nagy	Assurance Director
Randy Shackelford	Nuclear Safety & Licensing Section Manager
Jennifer Wheeler	Licensing & ISA Manager

List of Items Opened, Closed, and Discussed

Opened

70-143/2010-002-02	VIO	Failure to establish an inspection program for sprinkler systems designated as IROFS. (Paragraph 2.c)
70-143/2010-002-03	URI	Evaluation of combustible loading of Tube Cleaning Room due to tar roof and resulting consequence evaluation. (Paragraph 2.c)
70-143/2010-002-04	URI	Evaluation of analysis supporting “unlikely” probability of fire in solvent extraction area. (Paragraph 2.c)

Opened & Closed

70-143/2010-002-01	NCV	Failure to Comply with Criticality Safety Procedures. (Paragraph 2.b)
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Closed

70-143/2007-004-02	IFI	Incorrectly Designed Check Valve for Application. (Paragraph 5.a)
70-143/2008-002-01	VIO	Failure To Perform Plant Modifications In Accordance With 10CFR70.72. (Paragraph 5.b)
70-143/2009-003-02	URI	Analysis of Fire in Building 105. (Paragraph 5.c)
70-143/2009-003-03	URI	Implementation of Recommendations of Fire Hazard Analysis. (Paragraph 5.c)

Documents Reviewed

“Risk-Informed, Performance-Based Fire Protection Assessment of the Solvent Extraction Process Area BLEU Preparation Facility, Building 333,” Rev. 0
 “Fire Hazard Analysis, 300 Complex,” Rev. 0
 “BLEU Preparation Facility ISA Summary,” Rev. 7
 “Quarterly Fire Door Inspection,” 4th Quarter 2009 and 1st Quarter 2010
 “BPF Chemical Makeup Process Equipment; TankXX-2L03 Dike Capacity Set Point Analysis”
 NFS-HS-B-85, “Portable Fire Extinguishers,” Rev. 1, Attachment A
 NFS-HS-B-87, “Fire Hose Inspection,” Rev. 1, Attachment B & C
 NFS-HS-B-70, “Fire Detection,” Rev. 6
 NFS-HS-A-21, “Operation and Testing of the Crit, Fire, and CO2 Alarm Systems,” Rev. 29
 NFS-HS-E-10, “Emergency Communications,” Rev. 23
 NFS-HS-A-24, “Inspection of Emergency Supplies,” Rev. 8
 NFS-HS-B-58, “Fire Suppression Systems Inspections,” Rev. 17
 NFS-HS-A-68, “ISA Risk Assessment Procedure,” Rev. 4
 ODMI-09-006, “Operational Decision Making Issue, Evaluation of Fire Barrier Integrity in IROFS Space”
 “Fire Protection Program Assessment Licensing & Compliance Fire Protection Engineering,” Rev.0
 “Fire Hazards Analysis BLEU Preparation Facility Building 333,” Rev. 3
 “Fire Hazards Analysis Building 105 – Analytical Laboratory,” Rev. 0
 NFS –GH-62, “Control of Combustibles,” Rev. 05
 WI 010233, “High & Low Pressure Co2 Inspection & Testing Procedures,” Rev. 1
 ODMI-09-006, “Evaluation of Fire Barrier Integrity in IROFS Space”
 Drawing 013-A1000-D, “300 Complex Fire Safety Layout,” Rev. 0
 NFS-GH-25, “Hot Work Procedure,” Rev. 6
 NFS-FP-07-2009, “Building 105 Analytical laboratory FHA Assumptions/Recommendations Affect on Fire IROFS”
 DLA-10-004, “Annual Sprinkler Inspections in MAA Areas”
 PIRCS Problem Reports: 24789, 20557
 PIRCS Corrective Actions: 12717, 12718, 12719, 12721, 12722, 12724, 11557

List of Inspection Procedures Used

88135	Resident Inspection Program For Category I Fuel Cycle Facilities
88054	Fire Protection (Triennial)
88055	Fire Protection (Annual)